Journal of

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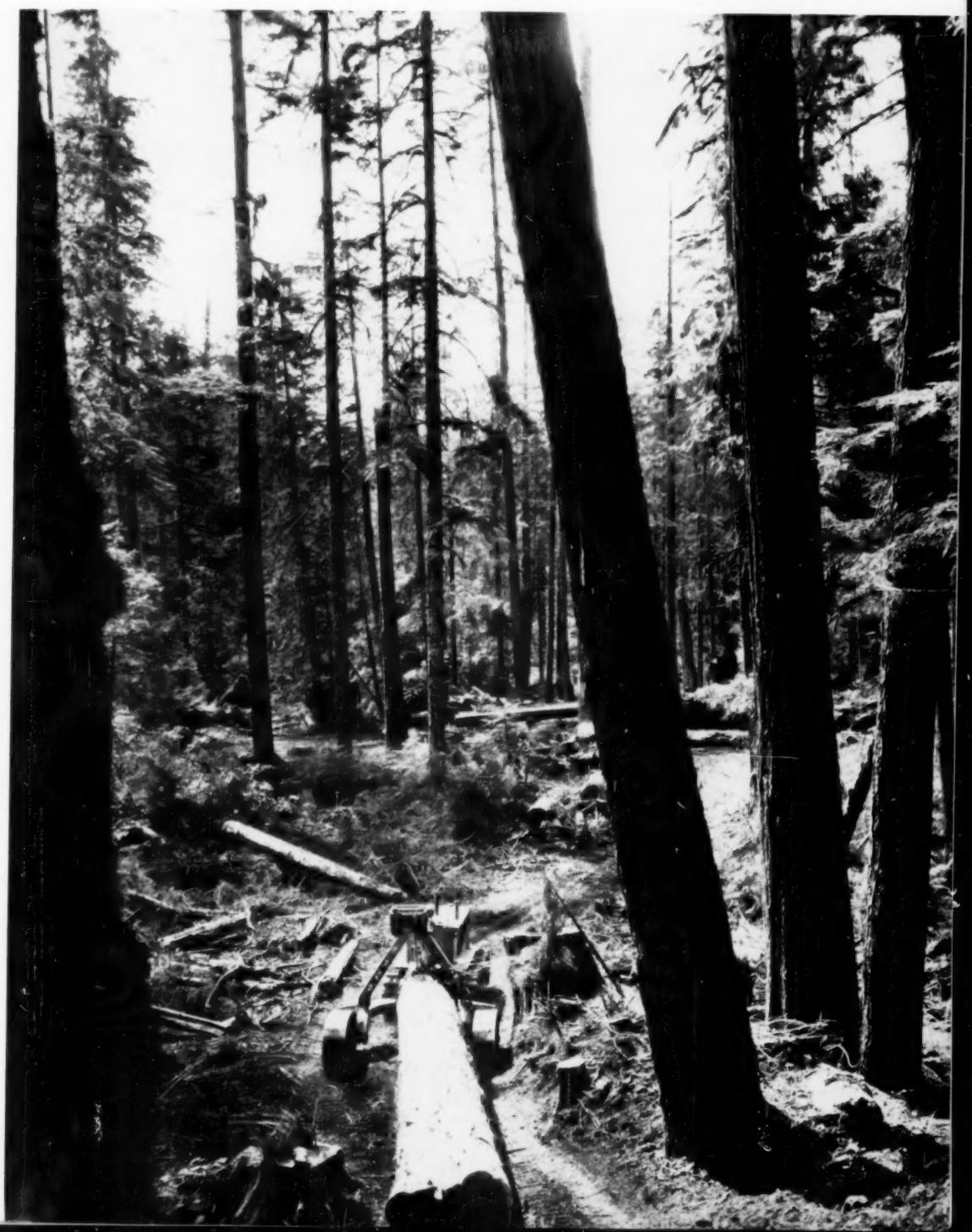
APRIL 1956



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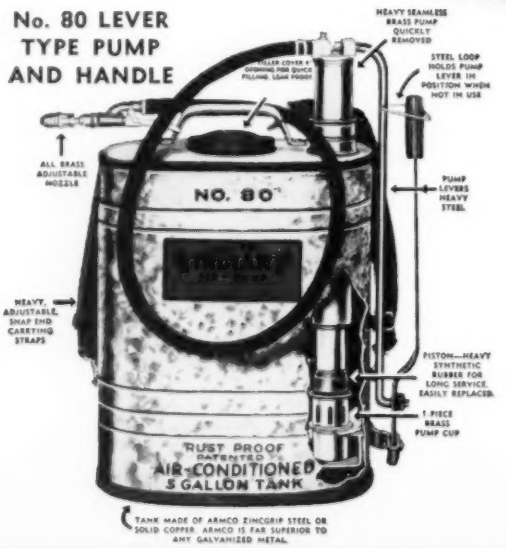
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Photo courtesy Caterpillar Tractor Company

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A Banker Looks at Forest Credit[1]

Ansgar R. Berge
Assistant vice president
Federal Reserve Bank of Boston,
Boston, Massachusetts

CREDIT is essential under modern conditions to the efficient and complete development of a community's resources. Until very recent times, however, credit has not been available to develop the timberland resources of the nation in accordance with principles of sound forest management. The forest owner could obtain needed funds by selling his standing timber but so far as utilizing it as collateral for a loan was concerned it was largely a frozen asset. This worked against the adoption by forest owners, and especially the smaller owners, of a program of growing trees as a crop and tended, in fact, to encourage the wasteful and destructive handling of the country's timberlands. Today, however, the situation has changed and there is definite promise that forest credit is becoming available to qualified forest land owners. In the South, a few of the larger life insurance companies are currently extending forest credit on a limited scale as are some of the Federal Land Banks to a lesser degree. Further evidence of the changed situation is the growing interest of commercial banks in this virtually unexplored field of loan potential and of resource improvement opportunity. It is an area in which the local commercial banker today can and will make a significant and lasting contribution to sound forest development throughout the nation.

In many states commercial banks, organized under state charter, have been for years authorized to take a first mortgage on real estate as security for a loan and this no doubt was broad enough power to include the right to take a mortgage on a tract of standing timber. Few, if any, exercised the authority so far as timberland mortgages were concerned. National banks had never been authorized to do so until at the urging of commercial bankers and forestry representatives Congress enacted in 1953 an amendment of section 24 of the Federal Reserve Act. The legislation was passed over strong doubts voiced by the Comptroller's office as to its soundness from a commercial banking standpoint. Reflecting perhaps this understandable apprehension, the statute limits the right of the national bank to extend forest credit in several ways. The bank may loan only up to 40 percent of the value of the merchantable timber on the tract. The margin of collateral must be maintained throughout the period of the loan. The lien is required to be represented by a first mortgage and furthermore the maturity of the loan may not exceed two years unless annual amortization is required by the terms of the credit. Loans may run for so long as ten years if amortization of principal each year amounts to at least ten percent. The latter condition is a flexible one and may prove to be of considerable value in individual situations to timber owners who face special problems. For example, a timber tract owner may find it economically desirable from the standpoint of sound forestry management to defer a substantial harvesting of trees for five years and yet may need immediate funds which he proposes to raise by means of a loan. The tract, it is further assumed, during the first four years of the period is able to produce returns that would enable the owner to meet not only interest payments on the proposed loan but also amortization of not less than ten percent each year. The substantial cutting in the fifth year would be sufficient to pay the balance due on the loan at its maturity. Under a reasonable interpretation of the statute such a loan would appear to qualify since it prescribes a minimum amortization rate of ten percent annually.

Far more significant, however, than the technical banking requirements of collateral value and maturity, the new law points directly to the objective of improving timber management. Credit extended by a national bank on a forest tract is conditioned on the existence of proper management. The statute refers to the forest land as being "properly" managed but does not define what is meant by proper management. The Comptroller has, however, issued an interpetation to the following effect. First, there must be organized state or private fire protection. Second, there must be organized protection against insect damage where such damage is of marked proportions; otherwise, there must be adequate access roads and other means of prompt and immediate salvage. Third, the cutting practices followed by the owner must be such as will tend to permit the tract to reproduce successfully and will insure continued

[1]Adapted from a thesis submitted by the author, assistant vice president, Federal Reserve Bank of Boston, in partial fulfillment of the requirements of the Graduate School of Banking conducted by the American Bankers Association at Rutgers University, June, 1954. Responsibility for statements made in this paper is solely that of the writer and in no sense is to be attributed to the Federal Reserve Bank of Boston, the institution with which he is associated.

growth. In connection with the latter, the Comptroller has also indicated that compliance may be evidenced by cuttings based on the marking of trees by a qualified person.

The principal deterrent in the minds of many commercial bankers to extending forest credit is the danger of fire and the possibility of loss of the standing timber that comprises the collateral for the loan. This is a misconception, as the following analysis of the New England situation shows, and needs to be clarified. There is no reason to believe that the conclusions reached below are not in the main equally valid for the other forest areas of the nation with adjustments to reflect regional differences.

Forest fires in New England occur on the average on less than two acres out of a thousand acres per year based on the ten-year official record covering 1943 to 1952. It compares with around 9 acres per thousand acres for the nation as a whole. Another consideration to bear in mind is that these statistics are based on official reports and according to a study made several years ago[2] official reports tend to overstate the occurrence of fire by as much as 25 percent. In other words, the risk of fire occurring on a given tract of forest in New England may be said to be something less than two out of a thousand. Another vital factor in determining the risk of loss of the timber collateral from fire is the fact that the official figures of fires on forest lands include not only fires that affect growing marketable timber, but also fires that do nothing more than burn over worthless scrub. So this, too, is a modifying factor in appraising the possibility of loss. In comparison, it may be pointed out that the average risk of loss on unsecured commercial loans of the member banks in New England arising out of insolvencies, bankruptcies, receiverships and so on amounted to about 2/10's of one percent per year during the 1947 to 1952 period. The risk of loss on business loans was accordingly as high as the risk of fire occurrence (not necessarily fire *loss*) on the New England forest lands. If adjustments are made for the modifying factors referred to above in connection with forest fire data then the risk of occurrence of forest fire was less than that of the banks' losses on business loans. Both figures are given before recoveries or salvage and this is significant.

Salvage of timber following a forest fire is frequently overlooked or misunderstood by many bankers. Forest fires of even the most disastrous type do not burn to ashes the live *merchantable* trees on a tract. A conflagration will often kill mature timber but it will not necessarily render it a complete economic loss. Young growing stock of less than merchantable size will usually be unsalvageable and may even be consumed in such fires but, while a great loss for future generations, these are not the trees upon which a bank loan would be based.

What then are the salvage probabilities, looking at them again as a banker would in appraising collateral offered for a loan. Here the figures developed in connection with the salvage operations following the great conflagrations in southwestern Maine in 1947 provide an actual case study. In the analysis no attempt was made to consider individual tracts, but the whole area was taken into consideration. Looked at from this viewpoint, the total salvage amounted to better than 75 percent of the total saw timber in the saw-timber stands. That was on a quantitative basis. The total return from the salvage operations was something less than if the trees had been cut in ordinary logging operations before the fires. Ordinarily this is true. There will be some degrade in price for timber salvaged after a fire but it rarely amounts to as much as 25 percent. In the Maine case it amounted to 18 percent and the final result showed a 60 percent recovery dollar-wise on an overall basis. It thus showed clearly that a bank loan secured by the saw timber on the burned-over areas of the saw-timber stands would have retained an ample margin of collateral value over the 40 percent collateral value minimum set forth by the statute. In contrast, recoveries on "sour" loans by 170 reporting member banks in the First Federal Reserve District amounted to only 35 percent on the average during the 1947-1952 period. The Maine experience corroborates the statements made by experts during the hearings in Washington on the change in the law to the effect that ordinarily salvage after fire damage will run from 60 to 80 percent in the timber stands which would be eligible for credit.

On the problem of forest fire as a credit risk the experience of the life insurance companies, mainly in the South, is significant. Substantial loans with maturities running well beyond the maximum ten year period allowed national banks have been made in recent years. Forest fire insurance has not been required as a mandatory condition to making the loan but rather emphasis has been laid upon the existence of high-quality and adequate forest fire prevention and suppression programs. Here is concrete, tangible evidence that the risk of fire of itself is no absolute bar to the making of soundly devised and intelligently planned forest loans.

It should always be borne in mind in discussing various credits from the commercial bank's point of view that it would select its risks with care. Not every tract would be considered eligible for mortgage credit any more than every applicant for a loan is considered entitled to or worthy of credit. Salvage potential would be examined carefully and would be a prerequisite to an extension of forest credit, and this would turn in large measure upon the accessibility of the tract.

Bankers need to be informed of the factors regarding forest fire occurrence and salvage possibilities so that they may have a better understanding of the credit risk involved. Careful critical examin-

[2]Shepard, Harold B. Forest fire insurance in the northeastern states. Tech. Bul. No. 651. U. S. Dept. Agric. 1939.

ation of the fire risk with willingness to probe beneath the often expressed surface opinion that fire is an insuperable obstacle to forest credit, will in many cases provide convincing evidence that a given forest tract is worthy of commercial bank credit. This despite the absence today of fire insurance on forest lands at a reasonable premium charge. It is not entirely impossible to buy forest fire insurance today but excessive premium rates, too high for the average owner, are still the general rule. Shepard's classic study on insurance for the Northeast and his earlier one on the Pacific Northwest[3] indicate clearly that premium rates could be substantially lowered. There seems to be a strong likelihood that something will be done about it in the near future. More and more interest is being shown in developing practicable forest fire insurance at reasonable rates. Helpful measures may very well develop out of all of the discussion that is currently going on in forestry and insurance circles along these lines. Suggestions, for example, have recently been made for mutual forest fire insurance companies to be organized by forest owners similar to those in Sweden. On the other hand, the old line companies currently indicate a more lively interest than ever in the program, and it is reasonable to expect that constructive developments will take place in this field within the next few years. In any case it is to be noted that, as indicated above, the absence of reasonably priced forest fire insurance has been no stumbling block to substantial extensions of forest credit by life insurance companies in the South. It need not be, and should not be, a stumbling block for the commercial banks.

Another deterrent to extensions of forest credit by a commercial bank may be the fear of loss of collateral through insect and disease damage, as well as windfall and weather. Insect and disease damage, however, is usually of a more endemic character striking single species of trees and even after epidemics recovery can often be had by prompt salvage operations. In large measure this will also apply to damage by windfall and other forms of damage from the weather.

Market change might also be considered a deterrent. If the price of stumpage declines radically, then obviously the collateral is in danger. Studies indicate that the price of timber stumpage tends in general to follow the commodity price index. This at least shows that timberlands are a relatively good hedge against inflation. With respect to demand, the change in the future is not likely to be so drastic within the relatively short period of years covered by a commercial bank mortgage as to warrant any real apprehension. A recent study[4] concludes that in the next decade total demand for lumber will continue to rise moderately and total wood consumption to increase substantially, mainly as a result of expansion of wood pulp manufacture. In any event the banker is faced with similar problems in other credit fields, and the margin of safety provided in the collateral value of the trees should ordinarily cover this risk adequately.

These then are some of the considerations more or less unique to timber which a banker would give heed to in extending forest credit. In addition, of course, he would evaluate the credit in the light of ordinary banking standards such as the general credit worthiness of the borrower as a moral risk and so on. He would also give thought to the sources of earnings or returns which would be available to pay the interest on the loan and ultimately the principal. If the hardest case is taken, that is, one in which the owner expects to service the loan from the production of his timber tract, then what is the situation? Ordinarily an owner, particularly a small owner, would not remove timber from his tract every year in order to produce income to pay the interest and principal on the mortgage. Since the cutting cycle commonly recommended is from five to ten years, how can the borrower obtain sufficient revenue from the forest tract to service the loan?

Clearly every case stands on its own feet. The credit must be tailored to the particular needs and capacities of the borrower and still must be consistent with accepted banking practices. Sometimes these practices seem to get in the way. For example, take the practice of requiring annual interest. Would not interest paid every year and a half, or even every two years, be adequate at least in some special situations? Even so it is entirely possible that by careful selection of his forest loan applications, a banker could find a tract which will produce harvestings of timber sufficient to meet annual principal and interest charges. It is common practice to divide a tract into compartments for cuttings with cutting to be done in each compartment in a different year. This can be accomplished even though a five-year cutting cycle is established, and if the tract permitted division into five or more compartments, then conceivably the owner would obtain cuttings each year sufficient to meet his annual interest and principal charges. In some cases improvement cuttings might take care of at least part of if not all of the annual interest and principal charges until the appropriate time had arrived for a substantial harvesting. Another possibility would be this. If the tract were ripe for a cutting during the first year of the loan, the owner could in effect prepay a part of the loan in time sufficient to carry him over until the next cutting season, some four or five years later. Such in effect was an actual program carried out by a farmer in the St. Louis district as reported in the Federal Reserve Bank of St. Louis *Monthly Review* for December 1954.

Commercial banks are not organ-

[3] Harold B. Shepard. Forest fire insurance in the Pacific Coast States. Tech. Bul No. 551. U. S. Dept. Agric. 1937.

[4] Report by Stanford Research Institute, Stanford, California, to Weyerhaeuser Timber Company. "America's demand for Wood 1929-1975." 1954.

ized to extend credit to grow trees from seedlings to maturity. They are organized, however, to extend credit under appropriate circumstances for at least part of that term of years. Significant changes have taken place in relatively recent years, and continue to take place, in the commercial banking structure of the nation. Departure has been made to some extent from the once orthodox view that a commercial bank was strictly a short term institution, that since its liabilities were demand obligations its investments necessarily had to be exclusively short term investments. This still applies, of course, in large measure to commercial banks without substantial time deposits but there have been fundamental changes. For example, the insurance of deposits may well have tended to reduce substantially the danger of sudden wide-spread withdrawals of demand deposits. Liquidity of the banking system has been provided to a greater degree than ever before by the expanded powers of the Federal Reserve Banks to extend credit on the basis of practically any type of asset held by the member banks. Federal Reserve Banks are lenders of last resort, and today possess very broad powers to discharge their responsibilities in this important area of providing liquidity to the banking system. Reflecting these and other modifications, commercial banks no longer confine themselves solely to short term investments, but invest to some degree in term loans, Government long term bonds, and real estate mortgages extending over several years.

Bankers, as a group and individually, are interested in forestry problems, nationally and locally. It is a new field to many of them but they are giving it a great deal of attention and thought. The American Bankers Association has a national forestry committee which has functioned now for several years. State banking associations mainly in the areas containing economically important timber resources carry on well-planned forest educational activities. It is all part and parcel of the general movement going on throughout the country in creating a vigorous forestry program that will develop the great forest resources of the nation. Commercial banks are playing an important role in the development of the program and in the years ahead will play an ever increasing share in placing the forests of the nation on a continuous productive basis.

Summary

Forests provide a large and essential raw material natural resource that can be made ever renewing. They need to be developed to a higher state of productivity. Commercial bank credit can be of great assistance in achieving this vital objective. Up to recent times, such credit was not available and as a result the forest lands were, in a credit sense, largely frozen assets. Thawing of them is taking place by virtue of the 1953 amendment to the Federal Reserve Act which permits national banks under certain defined conditions to make first mortgage loans on properly managed timberlands. In selected cases, forest tracts will be able to meet accepted banking standards for commercial bank credit.

Fire or the risk of fire does not constitute an insurmountable obstacle for the granting of forest credit by commercial banks under the standards set up by the law. Possibilities of salvage are frequently not taken into consideration in determining the risk of loss from this casualty or if taken into consideration are not properly evaluated. At present, in fact, no greater risk of loss appears to exist in forest credit than in many traditional fields of bank credit.

Servicing of the bank loan can be taken care of in many cases by appropriate timing of principal repayments correlated with cutting cycles and improvement cuttings.

As in the case of agricultural credit, forest credit requires careful advance planning by banker and customer, and subsequent follow-up of the actual carrying out of the plan. Local commercial bankers are vitally interested in assisting forest owners in their areas to adopt better and sounder management on their timber tracts. They have long been interested in the educational phase of the problem, and today are looking forward to practical implementation of their forestry programs by means of extensions of forest credit pointed directly toward the growing of trees as a crop. Through the partnership of forest owners, private and government forestry organizations, and bankers, commercial bank forest credit will in the days ahead materially aid to develop the timber resources of the country into an ever-renewing source of basic raw materials essential for the continued growth and prosperity of American industry.

Forest Snowmelt and Spring Floods

J. M. Rosa[1]
Hydrologist, U. S. Forest Service,
Intermountain Region, Ogden, Utah

These hydrology studies attempt to compute flood hydrographs from relationships developed for some of the physical factors influencing snow storage and melting. It may be possible to estimate the effects of forests on spring floods if practical methods can be devised and tested for expressing what we have observed about forests and snow.

To PROVIDE a basis for estimating the effect of forests for the major timber types and elevations within the Snake River Basin, Idaho, the snow storage and melting at a number of courses was measured as well as the timber and soil conditions on a series of ¼-acre plots. Snow depths and rates of melting were compared between forests and adjacent openings at several locations in Idaho, Wyoming, and Utah intermittently during the period 1949 to 1952 (Table 1). About 40 snow courses in the open were also surveyed to study the effect of elevation and aspect upon snow accumulation and melting. Snow distribution within forests was significantly correlated with timber volume and crown density, while snowmelting in the open was related to temperature, aspect, and elevation at various times during the melting season.

Basic data used for the computation (Table 2) of spring runoff hydrographs are: (1) snowmelt related to climatic, topographic, and cover variables; (2) losses from evaporation and transpiration; (3) rainfall contributing to streamflow; (4) soil moisture storage capacity and antecedent deficit; (5) groundwater storage-discharge curves; and (6) routing of channel flows.

1. *Snowmelt* was computed from mean daily temperatures using graphs involving the separate effects of aspects, elevations, and seasonal mass temperatures. Rates of melting were determined for large openings and adjusted for conditions within forests. The distribution of the snow cover under forest canopies and in small openings was observed to depend upon such variables as timber volume, crown density, and total snowfall (Fig. 1). For any daily temperature, then, the method is to read basic open melting rates from Fig-

[1]Members of Flood Control Surveys, Intermountain Forest and Range Experiment Station, who contributed field observations for this study included: M. H. Tigerman, W. E. Murray, G. W. Carlson, H. H. Price, and E. H. Bomberger—foresters; O. C. Olson, soil scientist; and R. W. Payne, draftsman.

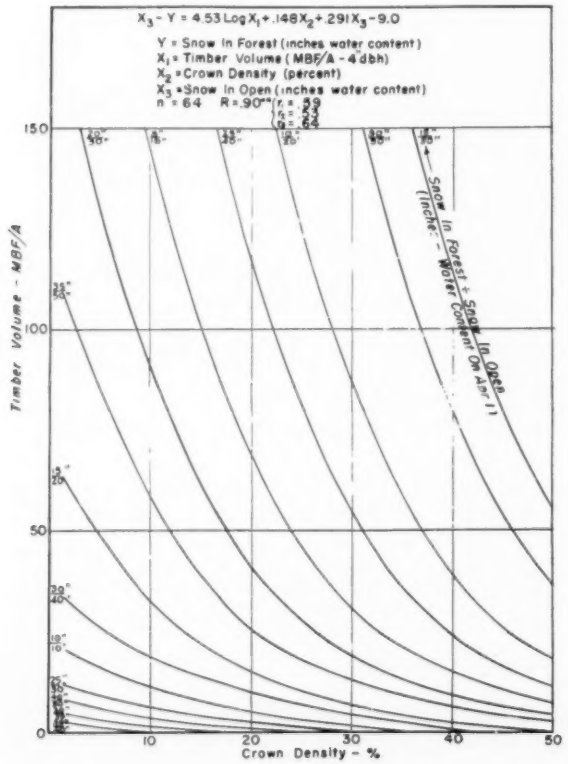
X3 - Y = 4.53 Log X1 + .148 X2 + .291 X3 - 9.0
Y = Snow in Forest (inches water content)
X1 = Timber Volume (MBF/A - 4" dbh)
X2 = Crown Density (percent)
X3 = Snow in Open (inches water content)
n = 64 R = .90**
Timber Volume - MBF/A
Crown Density - %
Snow in Forest + Snow in Open (Inches - Water Content On April 1)

FIG. 1.—Snow storage in forest and open, Idaho, Wyoming, Utah, 1949-1952.

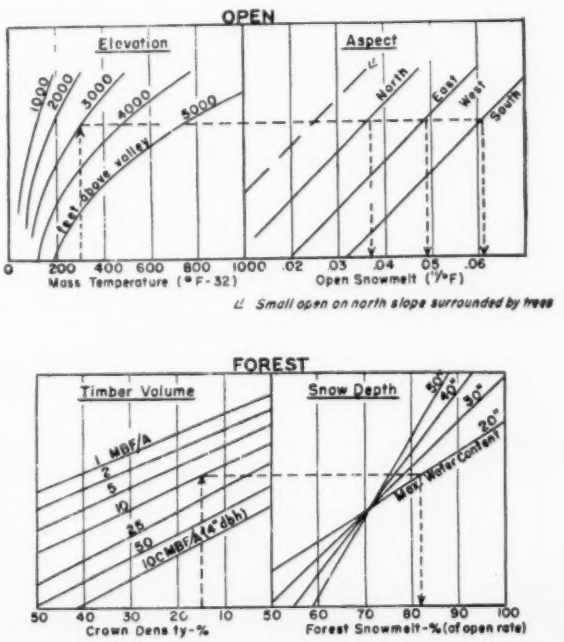

FIG. 2.—Snowmelt in forest and open, Idaho, Wyoming, Utah, 1949-1952.

TABLE 1.—COMPARISON OF FOREST AND OPEN SNOW PLOTS, 1949-1952

Plots	Timber type	Location	Elevation	Crown density	Timber volume Merch.	Timber volume Total	Snow water content Open	Snow water content Forest	Difference	
No. x yrs.			*Feet*	*Percent*	*MBF/A*		*Inches*		*Inches*	*Percent*
5	Aspen-oak	Utah	6,400	—	—	—	16.0	15.0	1.0	6
8	Pine-fir	Idaho	5,600	16	108	113	22.3	14.9	7.4	33
14	Lodgepole	Idaho	6,000	17	9	17	23.1	18.3	4.8	21
14	Pine (mixed)	Ida., Wyo.	6,700	26	4	11	24.4	19.4	5.0	21
19	Spruce-fir	Ida., Wyo.	7,700	30	55	85	35.3	22.3	13.0	37
11	Spruce (clumps)	Utah	7,600	37	33	53	29.7	14.9	14.8	50

TABLE 2.—EXAMPLE OF SNOWMELT HYDROGRAPH COMPUTATIONS, SOUTH FORK OF SALMON RIVER, IDAHO, MAY 1948

Date	Temperature: Mean daily (°F-32)	Temperature: Total mass	5,000-5,500 ft.: North slope	5,000-5,500 ft.: South slope	5,000-5,500 ft.: East-west	5,500-8,000 ft. 5 elevation zones	8,000-8,500 ft.: North slope	8,000-8,500 ft.: South slope	8,000-8,500 ft.: East-west	Snowmelt 5-day total	Rain[2]	Losses[3]	Daily Runoff—Routed: Inflow	Daily Runoff—Routed: Storage	Daily Runoff—Routed: Outflow	Line
	Temperature at Deadwood Dam, Elevation 5,300 ft.	Cumulative temperature above 32°, after January 1.	Snowmelt on north-facing slopes, see Fig. 2.	Snowmelt on south—facing slopes, see Fig. 2.	Snowmelt on other slopes, see Fig. 2.	(Description of procedures)				(in. x mi.)	Rain at Deadwood Dam, elevation 5,300 ft. (in.)	Evap-transpiration loss, see Fig. 3. (in. x mi.)	Total snowmelt runoff, less losses. (cfs)	Groundwater storage, see Fig. 4. (cfs x days)	Discharge vs. storage, see Fig. 4. (cfs)	
						(1) Snowmelt rates ("/°F-32) by aspect and elevation, see Fig. 2.										
						(2) Rate ("/°F-32) x temperature (/°F-32) x area (sq. mi.)[1]										
						(3) For snowmelt rates in forests, see Fig. 2.										
						(4) Snowmelt (in.) x area of commercial timber (sq. mi.)[1]										
						(5) Snowmelt (in.) x area of lodgepole pine (sq. mi)[1]										
May																
1	—	146	.055	.070	.060	(1) Open (see above)	.020	.050	.035	—	—	—	—	—	—[4]	1
2	—	—	—	.1	.5	(2) Open (see above)	.2	—	.1	20.3	—	—	—	3,400	170	2
3	2.5	—	—	—	—	(3) Forest (see above)	—	—	—	—	.26	.1	240	3,470	170	3
4	2.0	—	.1	—	.4	(4) Forest (see above)	—	—	—	—	.40	.1	210	3,510	175	4
5	4.0	154	.5	—	1.5	(5) Forest (see above)	—	—	—	14.0	—	.2	450	3,780	190	5
May																
6	15.5	—	.052	.067	.057	(1) Open (see above)	.022	.052	.037	—	.02	.9	1,780	5,330	265	6
7	10.5	—	—	.3	2.1	(2) Open (see above)	.7	—	.4	90.5	.20	.7	1,200	6,240	310	7
8	1.0	—	—	—	—	(3) Forest (see above)	—	—	—	—	.15	—	110	6,040	300	8
9	2.0	—	.6	—	1.9	(4) Forest (see above)	—	—	—	—	.05	—	240	5,980	300	9
10	6.0	189	2.1	—	6.4	(5) Forest (see above)	—	—	—	62.3	.90	—	720	6,390	320	10

[1]Areas by elevations and aspects from aerial photos, areas of timber types from timber surveys distributed by elevations and aspects.
[2]Effective rainfall on snowmelt area estimated from temperature, remaining precipitation added to snow pack.
[3]Includes soil moisture deficit, satisfied by fall rains in this case.
[4]Snowmelt and runoff during April not shown.

ure 2 for each 500-foot elevation zone and aspect at the appropriate season. These rates apply directly to the area of large openings. Melting rates within forests, classified for aspects and elevation zones by species of trees and age classes, are read from Figure 2 at the intersection of timber volume and crown density with an interpolation for depth of snowpack. These rates are multiplied, of course, by the number of acres in the various types.

In a computation extending throughout the spring melting season, the total water available in the forest openings governs the duration of melting. Drifts in the small openings shaded by the trees melt at comparatively slow rates similar to those in the forest but last longer due to the greater snow depths. The effective size of small openings was considered to depend upon the extent of shade afforded by surrounding trees and was therefore determined by the height and density of foliage times the angle of the sun during the season of rapid melting.

The total snow cover in open areas was determined from cooperative snow surveys and rain gauges in the vicinity. These catches were related to elevation in order to estimate winter precipitation upon the tributary watersheds (Fig. 3). Rainfall in the preceding October to December, of course, had to be added to the soil storage. In some abnormal years this antecedent rainfall was enough to reduce soil moisture deficits and set the stage for a major flood.

2. *Losses* occur between streamflow and the apparent snowmelt as observed by periodic snow surveys. Evaporation from the snow surfaces must be estimated and deducted from the observed rate of snow depletion. Temperature and wind movement are the main variables in evaporation from open surfaces. In forests the insolation from the sun and reduction in wind velocity are undoubtedly related to the character of the forest type.

Transpiration losses, especially later in the season, also must be included in depletion of soil moisture; these losses also depend on the variables as described above. The combined losses of evapo-transpiration have been determined at experimental locations throughout the country and related to such climatic factors as mean temperature and daylight hours. Fairly uniform losses have been computed for the same season at many locations over wide areas and therefore can be applied throughout this region. It seems best to combine all evapo-transpiration losses into about 17 inches annually for the forested mountains, Figure 3, and estimate daily variations from climatic factors.

3. *Precipitation* occurring after the last snow survey near the time of maximum snow accumulation (April 1) must be added to the snow pack at high elevations. If temperatures indicate that rain was falling, this moisture may go immediately to recharge the groundwater storage on that portion of the watershed near the snowline where snow is ripe from rapid melting or where there is no soil moisture deficit. Streams may sometimes receive inflow from rainfall as rapid as surface runoff where parts of the watershed are exposed bedrock, roadways, or water surfaces. Generally rainfall in central Idaho does not come in such large storms as to require computation of the effect of warm rain in accelerating snowmelt, although formulae are available to make the correction.

4. *Soil moisture* storage capacity depends on soil texture and depth, including litter and duff on the surface. Surveys of about 150 ¼-acre plots were expanded by delineation on aerial photos of rock outcrops, open areas, and forest types to give total storage on the sample watersheds. Soil profile descriptions on the plots included depth of litter and duff, soil tex-

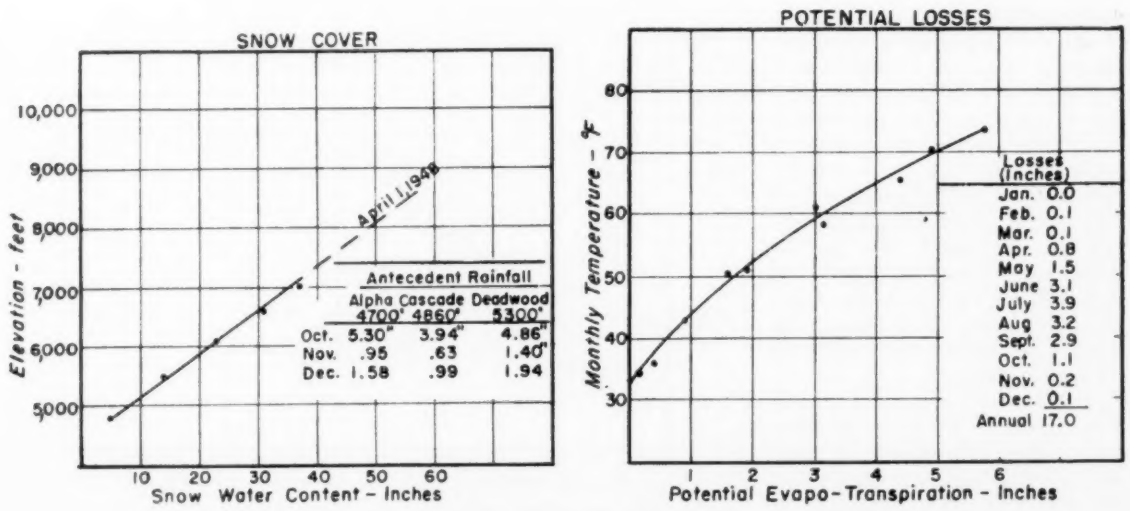

Fig. 3.—Snow cover and potential losses, South Fork of Salmon River, Idaho, 1948.

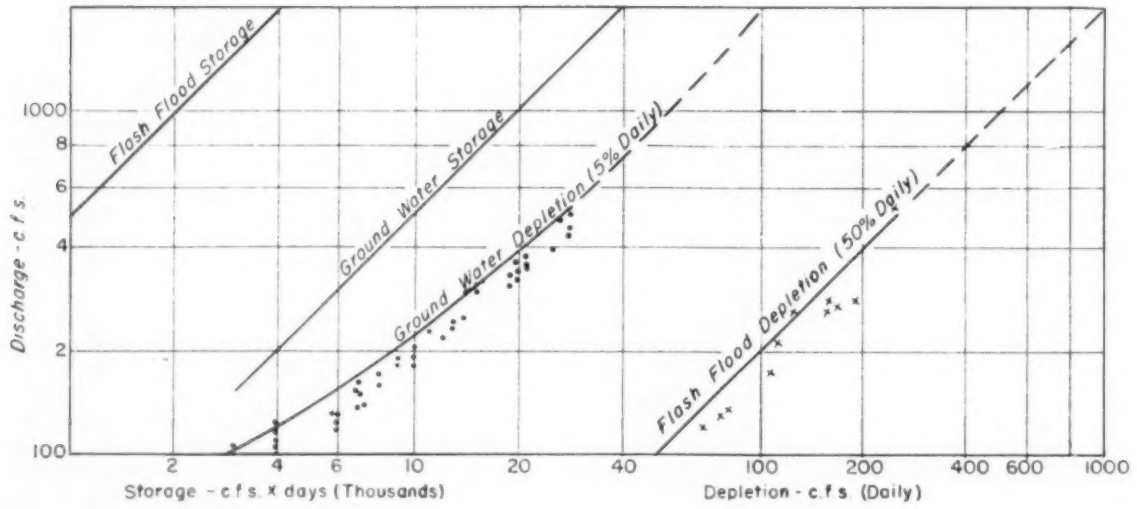

FIG. 4.—Storage and depletion curves, South Fork of Salmon River, Idaho, 1929-1948.

tures by horizons, and total depth. Forests modify soils by a deposition of litter on the surface with gradual incorporation of humus into the topsoil to improve the moisture-holding capacity. On a typical watershed the depth of litter and duff may vary between timber types and volumes within the magnitude of one inch.

5. *Groundwater* or baseflow hydrographs from stream gauges on tributary watersheds in the forested country show the rates of depletion of storage after having been recharged in the spring. The daily drop in runoff was related to the discharge to build a depletion curve as shown by Figure 4. Streams generally drop only about 5 percent a day at lower stages. By adding up the volume of such depletion curves, a storage versus discharge relation can be drawn for each watershed. By entering this figure for a given increase in storage, the increased flow in the stream can be read. Naturally the change is very small at low stages of late summer, but becomes quite large as groundwater storage builds up in the spring.

6. *Channel inflow* can be routed downstream to the gauge in order to reproduce hydrographs for large watersheds. However, the smaller the area, the less time lag is required to move the water from the

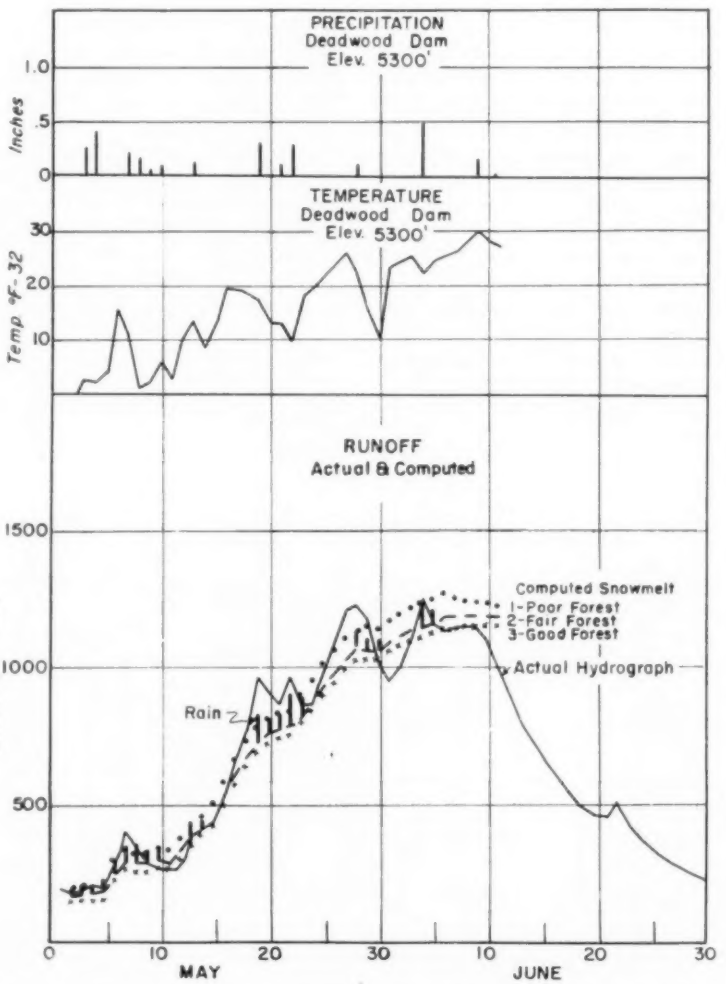

FIG. 5.—Computed snowmelt hydrographs for forest conditions, South Fork of Salmon River near Knox, Idaho, 1948.

center of the drainage down to the stream gauge. Where channel sections are typically uniform and only a few miles of channel are involved, this channel storage factor can be handled by shifting the time scale slightly during periods when the groundwater flow is fairly steady as from snowmelt runoff. Flash flood inflow from other sources should be routed when of considerable magnitude or changing rapidly.

A preliminary comparison was made between the present floods and the expected future runoff with different forest conditions—all hydrographs computed by the same procedures. An example of anticipated changes in the runoff from the 1948 snowmelt flood on South Fork is shown on Figure 5. The conditions assumed for the future are perhaps unrealistic in that the "good" forest represents complete protection from destructive cutting or fires for a long period of time, while the "poor" condition is after heavy cutting in the mature commercial timber, but without eroding the soil or reducing its moisture holding capacity. Only part of the hydrographs are shown for comparison, that is, the gradual build-up of groundwater from melting snow. The minor fluctuations due mainly to rainfall are not shown on the computed hydrographs for simplicity, since groundwater makes up the bulk of the flow. If South Fork is a typical forested watershed in central Idaho, it could be concluded that peak rates of groundwater flow would not change more than $\pm$ 5 percent due to the effect of forest changes on snow-melting in the future.

Summary and Conclusions

Hydrographs of spring runoff from melting snow can be computed from the relationships developed for these physical factors:

1. Snow storage and melting related to climatic, topographic, and forest characteristics.
2. Losses from evapo-transpiration varying with climatic factors.
3. Rainfall contribution depending on the effective area producing runoff.
4. Soil moisture storage determined by plant-soil types and antecedent conditions.
5. Groundwater discharge related to storage derived from streamflow depletion.
6. Observed streamflow consisting of groundwater plus routed channel inflows from other sources.

All of these factors have long been recognized as influencing streamflow; however, the charts and illustrated procedures contained in this paper now make possible a practical means of estimating the probable effect of forests on spring floods. The implications of previous research on experimental watersheds were that spring peaks could be modified by the effect of forests on snow—on tiny drainages at least. The preliminary hydrographs studied here seem to support that idea up to tributary drainages of 100 square miles or so, but the probable changes in peak flow may be much less in central Idaho, especially during major floods.

It must be remembered that the small watersheds studied here contain large openings of over one-half to two-thirds of their area, especially at the higher elevations covered only by scattered trees and deep snow. This area contributes rapid snowmelt and tends to minimize any changes in runoff caused by the use of the lower lying commercially forested lands.

He who every morning plans the transactions of the day, and follows out that plan, carries a thread that will guide him through the laybrinth of the most busy life. The orderly arrangement of his time is like a ray of light which darts itself through all his occupations. But where no plan is laid, where the disposal of time is surrendered merely to the chance of incidents, all things lie huddled together in one chaos, which admits of neither distribution nor review.

Hugo.

Adjustments in Forestry Education

Paul A. Herbert
Director, Division of Conservation,
Michigan State University,
East Lansing

FORESTRY SCHOOLS face major adjustments. They must accommodate increasing enrollments in a period of rising costs. They must provide training of greater breadth and also of greater depth.

These adjustments all tend to increase both the total cost of education and the cost per student. Educational executives are finding it difficult to obtain sufficient funds to provide the traditional four years of college education for an expanding student body, and even more difficult, to finance an increase in the length of college training. So universities are studying the traditional curricula and college teaching techniques in the hope of meeting the educational demands of modern society with the minimum increase in cost.

Educators are re-examining the much maligned lecture system. They are exploring the use of audio-visual aids and the closed circuit television as a means of providing mass education with a few highly qualified instructors. Questions are being raised, too, as to the efficiency of instruction obtained both in indoor and outdoor laboratory periods. Is it the most efficient expenditure of a student's time to spend an hour squinting through a microscope attempting to find and draw all of the characteristics of a single cell plant or animal? Is it an efficient expenditure of a student's time to spend from a quarter to a half of an outdoor laboratory period walking or riding to an area, there to find, eventually, a plant or animal whose life habits and characteristics he is studying? At best, the field trip portrays only conditions at the moment of observation.

The teaching and memorization of facts is under scrutiny also. Is it necessary, or indeed possible, to teach the identification of most of the plants and animals that the professional will encounter in his work? Perhaps it would be sufficient to teach him the principles of comparative morphology. Obviously, much time could be saved if college training were confined more largely to basic principles and their general application.

A few universities have experimented rather successfully with basic courses embracing the entire sphere of human knowledge to replace the traditional introductory courses now usually required in the freshman and sophomore years. Instead of a year of English, a course in communication skills is provided which includes English composition, some literature, public speaking, radio and television. Instead of introductory courses in chemistry, physics, botany, zoology, geography, etc., a course in natural science is given.

Required, too, is a social science course, based on anthropology, economics, political science, sociology, psychology and social psychology. That course includes much subject matter not now included in forestry curricula. Students in the past also were advised (usually mildly) to take a cultural course or two. Some of them did, most of them did not. Now some universities have a required course in humanities, covering art, literature, history, philosophy and religion.

These four basic courses furnish the broad foundation on which the three objectives of most college training is built—citizenship, professional knowledge and culture. Theoretically, these courses should reduce the time necessary to complete subsequent science courses. Unfortunately, most specialized subject matter departments, such as botany and chemistry, insist that they are unable to build their elementary courses on such a foundation. So while this experiment in education broadens the student's knowledge and outlook, these additional required courses decrease the amount of professional subject matter that can be crowded into a four year course of study.

Even though education research may bring forth effective short cuts in training of university students, it, nevertheless, seems likely that the period of forestry training will have to be increased. On this basis, the following five year forestry curriculum is suggested. It is designed to give the formal initial training required by those land managers who are responsible for the production of wood from forests with minor emphasis on other uses and services that such forests may render.

This curriculum is designed to train foresters to manage either private or public forest properties. Students who are particularly interested in private employment probably would use some of the 26 credits of electives to strengthen their knowledge in the fabrication and processing of forest products. Those interested primarily in public employ probably would also select additional courses from among those pertaining to the other goods and services supplied by forests. Students of exceptional ability, who plan two more years in resident instruction to qualify for the Ph.D. degree and for research positions, would undoubtedly select statistics and additional courses in the science departments supporting the particular phase of forest research in which they are interested.

This proposed curriculum would not reduce the time now spent by most students in courses necessary to gain proficiency in the management of forests for wood production. There are approximately 38 credits in the curriculum covering this subject. The courses designed primarily to manage all the other

resources of the forest total only 21 credits. Certainly, this is not overemphasis on the management of the other uses of a forest.

However, this curriculum will *not* train a man to manage forests for the production of wildlife, or for forms of recreation, such as are found in parks, or for soil and water conservation. Indeed, it is probably that in time the curriculum here presented may be considered to approximate the training that foresters in private employ should have. A separate curriculum with a smaller percentage of the time given over to courses in wood production may then be made available to students who expect to seek employment in public forest management.

Table 1.—A Suggested Five Year Forestry Curriculum

1st Semester	Credits	2nd Semester	Credits
Freshman Year			
Communication Skills	4	Communication Skills	4
Natural Science	4	Natural Science	4
[1]Mathematics	3	[1]Botany	3
[1]Physics	3	[1]Chemistry	3
[1]Mechanical Drawing	2	Forest Soils	2
Sophomore Year			
Social Sciences	4	Social Sciences	4
Humanities	4	Humanities	4
[1]Zoology	3	[1]Sociology	3
Identification of Plants	3	Identification of Animals	3
Civil Engineering	2	Civil Engineering	2
Junior Year			
Advanced Communications	3	Advanced Communications	3
[1]Economics	3	Animal Ecology	2
Forest Fire Protection	2	[1]Political Science	3
Hydrology	3	Forest Mensuration	5
Plant Ecology	3	Electives	4
Electives	3		
Senior Year			
Forest Entomology	3	Forest Pathology	3
Logging	3	Logging Cost Analysis	2
Photogrammetry	2	Nursery Practice	2
Silviculture	5	Timber Management	4
Electives	4	Wildlife Management	3
		Electives	3
Summer Term			
Forest Management	4		
Forest Engineering	4		
Forest Utilization	3		
Fifth Year			
Business Administration	3	Business Administration	3
Forest Economics	3	Forest Policy	3
Forest Recreation	3	Soil Management	3
Water Management	2	Fisheries Management	2
Electives	6	Electives	6

In addition to the above course requirements, students must offer six months of practical experience in forestry work.

Recommended Technical Electives

Accounting	3	Land Economics	3
Advanced Forest Management	3	Land Use Planning	3
Advanced Plant Ecology	3	Park Management	3
Advanced Range Management	3	Plant Genetics	3
Advanced Wildlife Management	3	Research Methods	2
Business Law	3	Soil Classification	3
Conservation Economy	3	Statistics	3
Conservation Policy	3	Wood Fabrication	3
Forest Administration	2	Wood Seasoning & Preservation	3
Journalism	2	Wood Technology	3

[1]All courses so designated may be omitted if passed off by examination before the beginning of the semester in which they are required.

The opportunity to pass off by examination the basic science courses (marked by footnote in Table 1) is recommended to avoid duplication. Some of the better equipped high schools now give most of the material covered in the elementary courses required in some of the college basic sciences.

The major differences in the forestry curriculum here suggested with those in common use are (1) the addition of basic core courses in human knowledge, (2) the addition of technical courses so that the forest land manager will be acquainted with the techniques required to manipulate forests for uses other than for wood production, (3) greater emphasis on the social sciences, (4) relegation to the elective list of all forest utilization courses not necessary to the management of forest land, and (5) lengthening the period of study to five years to permit adequate training for the three educational objectives.

The writer believes that forestry education must move in the direction suggested here if it is to implement the principle upon which forestry is predicated, the wise use for all time and for all people of a multiple resource—the forests of the United States.

L.S.U. Forestry Symposium

The Fifth Annual Louisiana State University Forestry Symposium will be held on the Baton Rouge, La., campus April 5 and 6. It is sponsored by the L.S.U. School of Forestry and the General Extension Service. This year's theme: "Forest Management in Plan and Practice." Speakers include an array of foresters prominent in industry, government, and education.

Management of White-Tailed Deer and Ponderosa Pine[1]

George Neils, Lowell Adams, and Robert M. Blair[2]

AMERICA'S most prized big game animal, the white-tailed deer (*Odocoileus virginianus macrourus*), near the western edge of its distribution, comes into contact with one of America's most prized lumber trees—the ponderosa pine (*Pinus ponderosa*). The overlapping of ranges of these two great resources sets the stage for some knotty problems in resource management. Conditions under study since the 1930's in northwestern Montana furnish an example of these problems and how they are being met by private, state, and federal agencies.

The purpose of this paper is to describe: (1) an overstocked winter deer range in a ponderosa pine forest, (2) the detrimental effects of overstocking on the forest, and (3) an analysis currently in progress leading to the solution of the problem.

The investigations and analyses reported here are the work of a great many individuals in a number of private, state, and federal agencies. In addition to those agencies represented by the authors, the U. S. Forest Service carried a very large share of the work.[3]

The winter deer range with which we are concerned in this report lies in the Fisher River Drainage, a tributary of the Kootenai River in western Montana just south of Canada. The deer range is located on the warm south slopes and in the creek bottoms. On these slopes and bottoms the climax tree union is Douglas-fir (*Pseudotsuga menziesii* var. *glauca* [Beissn.] Franco) with subordinate vascular unions of pine grass (*Calamagrostis rubescens*) in some localities and snowberry (*Symphoricarpos occidentalis*) in others (*12*). The area is largely in the subclimax stage in which ponderosa pine constitutes the dominant tree species.

It is desirable to maintain the forest in the subclimax stage because of the superior economic value of the pine. Stumpage value of the pine is $28 per thousand board feet compared with $12 for Douglas-fir.

Like much of the ponderosa pine forest type throughout the United States and Canada, the Fisher River forest lacks younger age classes of trees and is composed mostly of mature and overmature trees (Fig. 1). This means that as the virgin stands are cut there are no younger trees to provide future harvests.

We can roughly calculate the economic loss resulting from the lack of pine reproduction. A well-managed ponderosa pine forest may grow at an average rate of about 100 board feet of lumber per acre each year. At the stumpage value of $28 per thousand board feet, the pine forest is growing at the dollar rate of $2.80 per acre each year. In the Fisher River winter deer range there are about 32,500 acres of the ponderosa pine type. So each year that the winter deer range is not in production of pine regeneration it is sustaining a loss of $2.80 per acre on 32,500 acres, a total of about $90,000 per year. The virgin timber of the Fisher River is currently being cropped so that the need for reproduction is immediate.

There have been many attempts to explain the lack of pine regeneration. Almost every ecological factor that might be limiting has been called into account at one time or another. It has been sug-

FIG. 1.—Typical over browsed winter deer range in the Fisher River ponderosa pine forest. Note that the forest floor is almost barren of brush. Douglas-fir is the only conifer reproducing although the mature trees are predominantly pine. There is a sharp browse line on the Douglas-fir and all seedlings below that line are stunted or dead.

[1]Original paper presented at the 20th North American Wildlife Conference, Montreal, March, 1955. Published with abridgements, by permission of the Wildlife Management Institute, Washington, D. C.

[2]Respectively, vice president, J. Neils Lumber Co.; biologist, U. S. Fish and Wildlife Service, in cooperation with the Intermountain Forest and Range Experiment Station, Ogden, Utah; and district biologist, Montana Fish and Game Department.

[3]The authors wish to acknowledge the fine cooperation enjoyed throughout the field work and the preparation of this report from many officials of the Forest Service. They are especially indebted to Mr. Arthur L. Roe and members of his staff at the Missoula Research Center, to Mr. Fred W. Johnson, in charge of Wildlife, Region One, to Forest Supervisor Howard Ahlskog and his foresters on the Kootenai National Forest, and to Mr. Richard Griffith, forester, J. Neils Lumber Company.

gested that the site is too severe, the soil is not right, root competition is too great, seed sources are inadequate, seed is destroyed by rodents, forces of plant succession prevent continued existence of the subclimax species, and so on and on.

In 1945, as logging plans were initiated for the Fisher River, there was need to quit speculating about causes and to start finding out why there was no pine reproduction. In the 10 years since then, the area has been subjected to intensive research. Before discussing the findings of the research on pine regeneration, let us review the conditions existing in the deer population and the deer range.

Deer Population and Range Studies

The ponderosa pine forest of the Fisher River drainage has long been noted as an area where deer herds concentrate in large numbers during the winter. This influx from vast expanses of surrounding summer range has resulted in severe over-utilization of the available winter forage (Fig. 1). Although both mule deer (*Odocoileus hemionus hemionus*) and white-tailed deer winter on the area, primary emphasis here is on the latter species, as it is far more abundant. Also, its winter range coincides more nearly with the ponderosa pine timber type. Mule deer tend to winter at elevations above suitable pine sites.

We have little information about deer numbers and range conditions before the mid-1930's. Indications are that the herds may have been at a low ebb around 1900 (*7*). This decline was attributed, in part, to the fact that deer hides were used as legal tender, valued at 50 cents per hide, between 1898 and 1900. Deer numbers apparently increased through the years since then, aided by the establishment of a game preserve on the Fisher River in 1923, the inauguration of a buck law in 1933, and a series of years in which weather conditions favored herd increases. Studies made by the Forest Service in the mid-1930's (*6, 13*) give us our first documentation on conditions of the deer herd and the range. It is significant that the reports of these earliest studies mention deterioration of the range. The combined effects of favorable natural conditions and of the management practices had led to the development of one of the largest winter concentrations of white-tailed deer in Montana.

Deer censuses within recent years have afforded specific evidence regarding animal numbers and trends. Data from these studies of populations and winter mortality (*6, 8, 9, 10, 13, 19, 20, 26*) indicated that the wintering white-tailed deer herd has been more or less stabilized over the past 10 or 20 years. Annual fluctuations occur as a result of variable winter mortality.

The most recent studies (*9*) on the area found that the white-tailed deer winter concentration was one animal for 2.4 acres of range. This density ratio was calculated for the lower Fisher River area, where approximately 10,900 animals were found to be utilizing a total land area of about 26,300 acres. No detailed studies have been conducted on the remaining 21,700 acres of the winter range, but the population density was believed to be somewhat lighter here than in the lower Fisher River area.

Studies of range conditions were made in 1949 by State Game Biologists Schmautz and Zajanc (*20*). Their survey of plots in the deer wintering area showed that browse utilization varied from "heavy" to "very heavy."

As a result of many studies and recommendations made by the investigators, a few steps have been taken to alleviate the winter range conditions. The game preserve was abandoned in 1944. Since 1949 there have been limited seasons for hunting either sex of deer. But these measures have not resulted in hunter harvests sufficiently large to affect herd numbers appreciably.

The small hunter take results from several causes. Frequently the onset of winter weather does not occur until after the hunting season. As a result, the deer are more scattered and difficult to hunt. Also the area is remote from any large population centers which could furnish more hunters. Increased deer herds elsewhere in Montana and in adjacent states compete with the Fisher River herd for hunter attention. The nonresident big game license in Montana is $100, which eliminates hunting by most nonresidents from nearby Idaho and Washington and other states.

There are several measures that may be used to increase deer reductions. Legislation now pending will, if passed, allow the State Fish and Game Department to sell special permits at $20 to nonresidents to hunt in areas overstocked with deer. Good deer management also demands further liberalization of antlerless deer hunting, increased bag limits, and extended hunting seasons. However, we should recognize the possibility that even with the complete utilization of all available measures for deer harvest the hunter pressure may not suffice to keep the herd in proper balance with the range.

As frequently happens, some of the sportsmen favor the excessive deer numbers. This sentiment deters constructive management and will continue to do so until these sportsmen learn to appreciate the use of sound ecological principles in deer management.

In anticipation of the possible eventual reduction of herd numbers, there is need for information regarding methods of re-establishing range forage. Some forage species have been killed out over extensive areas. Also logging activities will leave unused logging roads, landings and skid trails, some of which will not be used for new forests and will be available for growing deer forage. To obtain information on proper regeneration measures, the State Fish and Game Department instituted browse reseeding studies in 1949 (*16, 20, 22, 23*) and browse planting studies in 1953 (*11*).

It is recognized that artificial regeneration of browse will be of

no avail until the existing deer herd is reduced.

Pine Regeneration Studies

In the light of the foregoing description of deer and range conditions, we can discuss factors that limit pine regeneration. These factors may be grouped for convenience into four categories—site quality, seed supply, seedbed conditions, and seedling mortality.

The ponderosa pine areas of the Fisher River are all classified by the Forest Surveys Division as Sites III or IV (*5, 15*). In addition there are a few areas of Site V which were too small to be classified in the extensive Forest Survey. It is apparent from this that most of the area is well suited to growing pine.

The number of seedlings occurring in an area is strongly influenced by the number of seed trees on the area. In harvesting the pine on the Fisher River, the J. Neils Lumber Company practices light selective logging which leaves heavy residual stands of mature trees, thus maintaining good seed sources.

The presence of an adequate seed source does not insure an adequate seed supply. There are many decimating factors that reduce seed abundance. Tree squirrels (*Tamiasciurus hudsonicus*) cut cones and fruiting twig tips (*25*) destroying about 75 percent of the cone crop. White-footed mice (*Peromyscus maniculatus artemisiae*) and chipmunks (*Eutamias emoenus luteiventris*) eat the seeds after they drop from the trees. Adams (*2*) found that these small mammals ate pine seed, and Squillace and Adams (*24*) found that about 90 percent of the seed that fell was destroyed before they had time to germinate. They attributed this loss primarily to the rodents. Other decimating factors, such as weather, insects and birds, probably take their toll of seed, but have not been studied in this instance.

The effects of seedbed conditions are important. The presence of a dense growth of competing vegetation reduces the germination of pine seed and induces stagnation of the seedlings that do become established (*17*). The presence of a thick duff layer also curtails germination. Wherever vegetative competition or thick duff occur, scarification or burning is necessary to lay bare the mineral soil.

Studies of seedling mortality were among the first objectives in the current research program. Deer browsing was considered a very probable cause of the lack of seedlings, for the few small trees that did exist were severely browsed and many were dead (*1*). Bowman (*11*) reported in his management plan for the Kootenai National Forest, which includes the Fisher River, that, "the presence of deer in large numbers on open south slopes is inimical to the production of ponderosa pine since they browse and kill practically all the young trees."

In 1946 seven deer exclosures, 16 by 32 feet in size, were built within the winter deer range. Both artificial and natural regeneration have been studied on these exclosures in comparison with paired control plots nearby (*3*). First, nursery stock was planted on the exclosures and control plots in the fall of 1946. The next spring revealed that deer had killed or severely damaged 60 percent of the plants outside the exclosures. The browsed plants were replaced with new stock that same year. By 1950, three years later, 99 percent of the unprotected plants had been killed or severely damaged by browsing. Plants inside the exclosures have thrived.

Meanwhile natural seedlings began to appear in the exclosures, greatly aided by a particularly heavy seed crop in 1948. Adams (*4*) reported that by 1951 there were 114 ponderosa pine seedlings on the fenced plots, 18 seedlings on the control plots. In 1953 there were 142 seedlings in the exclosures, and 23 on the control plots.

A one-acre exclosure was constructed near the mouth of Wolf Creek in 1948. Conifer regeneration is abundant in this exclosure which corroborates the findings just reported. No complete account of seedlings has been made on this exclosure, but in the summer of 1954 they were counted on one-half of it. Seedlings counted on that half acre included 599 ponderosa pine, 278 lodgepole pine, 89 Douglas-fir, and 75 larch. No count was made on the check plot but cursory surveys reveal only a few seedlings — probably fewer than 100 of all species on the entire acre.

Concurrently with the exclosure studies a survey of the winter deer range was made to determine the amount of conifer regeneration existing there, the extent to which it was browsed and the successional relationship of pine and Douglas-fir. With regard to the pine—Douglas-fir relationship, it was found (*1*) that, although the overstory was 66 percent pine and 34 percent Douglas-fir, the understory (three inches d.b.h. and smaller) was 33 percent pine and 67 percent Douglas-fir. This suggests a strong successional trend toward Douglas-fir. Inadequacy of restocking is indicated by the fact that only 21 percent of 704 mechanically located 4-milacre plots were stocked with pine reproduction and only 43 percent bore Douglas-fir reproduction. (An 80 percent stocking rate is considered adequate.) The study showed finally that deer were feeding heavily on both species of conifers and that they showed marked preference for the ponderosa pine, thus favoring the successional trend toward Douglas-fir.

Discussion

From the studies described above it is apparent that the pine's life is fraught with many dangers. From flower anlage to saw log the individual tree runs a gamut of limiting factors, any one of which may eliminate the tree from the forest population. In developing a rational program for management of ponderosa pine we are now prepared to analyze the primary current problem—how to obtain adequate pine regeneration. This involves the evaluation of those limiting factors which are preventing regeneration as a basis for deciding which factors may best be controlled.

Experimental deer exclosure studies have shown that adequate pine regeneration occurs where deer are excluded. Where the deer are present in great concentrations, as they are on their winter range, pine seedlings do not survive. The question arises whether we would overcome this effect if we eliminated other adverse factors, such as rodents, duff, root competition, etc., thereby producing such large numbers of seedlings that the deer could not eat all of them. While this particular point has not been fully explored experimentally (such an experiment is in progress), it is apparent that such treatment would not be successful. It seems unlikely that we could create such a quick and abundant surge of conifer growth that we could, with conifer browse alone, saturate and exceed the great demand for deer forage.

It is almost certain that the deer could absorb this added forage resource as fast as it is generated, either in increased consumption per deer or in increased numbers of deer resulting from a decrease in the number of deaths caused by starvation. We must therefore conclude that conifer regeneration can be accomplished only if deer numbers are greatly curtailed. Before discussing methods of accomplishing such reduction, we need to consider another aspect of the problem of limiting factors in pine regeneration.

Our experimental exclosures have produced adequate stocking of pine regeneration. Does this mean that we would expect to obtain adequate restocking if we simply eliminated deer on a broad practical scale? There is good evidence that this might not necessarily be the case. There is considerable variation in the stocking rates on the different experimental exclosures, depending upon many limiting factors other than deer. The lightest stocking rate on one of the deer exclosures is 400 trees per acre which is barely adequate for seedlings. Almost certainly there will be need in some situations for supplementary treatments in addition to deer control. The supplementary control measures which appear at present to be most likely to be needed are: insurance of adequate seed source by continuing to restrict the present cutting cycle to a light selective harvest, and possibly scarification, at least on those areas not badly denuded by heavy deer use. Censuses of mice and squirrels may show the need for their control also.

We are now ready to consider methods for reducing the influence of deer on pine regeneration. Obviously the best method of attaining such reduction is through increased cropping of deer by hunters. We have already mentioned the difficulty of achieving adequate hunter pressure.

What alternative methods are available for eliminating deer damage? Johnson and Adams (*14*) have suggested fencing as a silvicultural method under such circumstances. The primary obstacle to the use of this method is the cost. Johnson and Adams estimated that deer-proof fences would cost about $20 per acre if 160 acres were fenced, less for larger acreages. In the present instance we estimate much larger cost because of the steep, rocky terrain and higher labor costs. Our estimate for the Fisher River is about $45 to $50 per acre for 160 acres.

Can forestry afford such costs for pine culture? Here we enter the realm of forest economics. Within the limits of the present paper we cannot give a detailed analysis of all the implications of this problem in economics. We will present only the general considerations involved in answering such a question.

At present, foresters quite commonly spend $35 to $50 per acre, or even more, for planting seedlings wherever this is necessary to obtain regeneration. That such routine expenditures are of the same order of magnitude as the estimated fencing cost is empirical evidence that the fencing cost may not be prohibitive.

Another kind of evaluation consists of estimating expected monetary returns from timber growth in relation to the amount invested, including interest. Such an evaluation is presently in process by expert counsel and will be used by the J. Neils Lumber Company in deciding whether fencing is the best method.

Beyond these analyses, the Company's directors will weigh the cost-benefit ratio of fencing against the desirability of alternative investments that could be made with the same capital in improving other holdings or in acquiring other forests less costly to administer.

Summary and Conclusions

Several investigations of white-tailed deer and ponderosa pine in northwestern Montana have shown that browsing by deer is a primary limiting factor in pine regeneration. Heavy browsing results from an overstocking of deer on their winter range. This range roughly coincides with the best pine producing areas.

Since the deer are effectively blocking the regeneration of pine, the private and public agencies concerned with pine culture are confronted with the alternative of either controlling deer damage or discontinuing pine forestry following the harvesting of the present stand of virgin timber. The choice between these two courses of action will be determined by the practicability of reducing deer browsing to tolerable limits.

At present, the two methods of limiting deer damage that appear most promising are: reduction of deer numbers by intensified hunting, or fencing tracts of pine forest to exclude deer during periods of forest regeneration.

Deer reduction by hunting is the more desirable solution to the problem since it entails the proper management and utilization of the recreational resources. However, if this method is to be effective, the hunting pressure must be greatly increased. Hunting pressure can be intensified by several means: hunting both sexes of deer equally, extending hunting seasons, adjusting hunting season dates to weather conditions favorable for hunt-

ing, keeping access roads passable during hunting seasons, increasing bag limits, reducing out-of-state hunting license fees, and the like.

It is possible, however, that adequate hunting pressure will not be attainable even with all these measures. In that event, fencing appears to be the most feasible method of locally controlling deer damage.

Whether fencing is economically practicable is a problem in forest economics to be analyzed by those who manage the forests. In the event that fencing is considered a good tool, it is recommended that a pilot-project fence be established first to obtain more exact cost estimates and to test our experimental findings in their large-scale application.

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Willard Springer (1886-1956)

Willard Springer, Jr., of Wilmington, Del., chairman of the Delaware Forestry Commission, died suddenly on February 26.

Born April 8, 1886 in Rockland, Del., Mr. Springer obtained a degree in civil engineering at Lafayette College in 1907, and the M.F. degree at Yale in 1909.

In that year he was employed as a forester for the Pennsylvania Railroad and continued until late in 1912 when he became vice president and treasurer of a leather tanning company. Appointed in 1931 as vice president of the Industrial Trust Company of Wilmington, he was advanced to the presidency in 1934.

For thirty years he was an active member of the Delaware Forestry Commission, and served as chairman since 1937.

A Study of Lumber Grade Recovery from Chemically Girdled Red Oaks[1]

Orvel A. Schmidt
Assistant professor,
School of Forestry,
The Pennsylvania State University,
University Park

CHEMICAL girdling, or the use of chemicals as agents to kill trees and facilitate bark removal, is a rather new technique developed in connection with the problem of bark removal by the pulpwood-using industries. Most of the past research has been done in an effort to obtain a good chemical for bark removal purposes with little thought of its possible effect on the value of saw timber or lumber products. The purpose of this report is to present some information on the effects of chemical girdling on lumber grade and values as a part of a regular pulpwood girdling program, where saw logs are to be taken from select trees or from butt logs or larger trees.

A considerable amount of experimentation has been done to determine the value of girdling trees and treating them chemically with a sodium arsenite solution to aid in the removal of the bark (*3*). For most tree species, chemical treatment has proven to be a highly satisfactory aid in improving ease of peeling. The cost of such treatment is low, and it serves as a silvicultural tool. This may also be considered as a method of wood storage since the treated trees may be left standing until the pulpwood operator desires to cut them (*4, 7*). In pulpwood production, the advantages of chemical peeling may include: (1) the possibility of treating a year's peeling operation in a short period during the sap peeling season; (2) easier and cleaner peeling than sap peeling in certain species; (3) storage of wood for large operations (in the form of a tree) without cutting and stacking in a yard; and (4) the girdling of trees selected for harvest, thus effecting a thinning almost immediately even though trees may not be cut for one or more growing seasons.

Recent developments in improved wood utilization are beginning to create a change in our logging operations. Although combining of a saw-log and pulpwood operation has been generally considered as impossible, recent magazine articles emphasize more integrated operations (*1, 2, 5, 6*) clearly indicating that a compromise in saw-log—pulpwood operations is being accepted. Chemical girdling might well be a solution to the problem of producing bark-free pulpwood and quality logs for saw timber from the same tree. From observation of logging jobs, cases have been noted in which good veneer and saw-log timber has been cut into pulpwood; while in most saw-log operations, top wood is left in the woods when peeled wood requirements must be met. Mill men also report that saw logs cut from treated trees have not produced satisfactory lumber. The need for some research on values of girdling has become apparent from such various observations.

Objectives of the Study

1. To determine how long oak trees can be left standing after being girdled and chemically treated with sodium arsenite without effecting grades of lumber produced.
2. Whether bark will peel readily from the tops if trees are cut shortly after chemical treatment.
3. Whether top material can be cut into pulpwood bolts at the same time that logs are cut and still peel satisfactorily.
4. If slabs produced in sawing lumber will peel readily so they may be converted to pulpwood.
5. What percent grade reduction may be expected.

Procedure

The number of trees used was small so that all were treated in one day, June 28, 1954. Basal girdles were made by pounding the bark off the tree with the head of a single-bit axe. The commercial arsenite preparation known as Atlas "A" Debarking Compound, made by Chipman Chemical Company, Bound Brook, New Jersey, was applied in the prescribed manner. For every tree treated a check tree was left untreated. In all cases an effort was made to select two trees of about equal diameter located near each other. A total of 20 trees in the red oak group was treated; these were either scarlet oak (*Quercus coccinea*) or northern red oak (*Quercus rubra*).

At weekly intervals, beginning one week after treatment, two pairs of trees were cut and taken to the mill to be cut immediately into lumber. The lumber from all trees was stacked together so that drying conditions would be equal for all considerations. Observations on the condition of the logs and lumber were made at the time of cutting. The top wood from one check tree and one treated tree was cut into pulpwood bolts and bunched awaiting further checks. The tops of the other two trees were left intact. After the seventh week of the study, trees were cut at two-week intervals in order to extend the test over a somewhat longer period.

Observations

The initial observations on treated trees are listed in Table 1. All logs cut from control trees were sound and resembled any normal log which would be cut in logging operations.

In regard to the first objective of this investigation, specifically to answer the question as to how long oak trees can be left standing after treatment without affecting the grade of lumber produced, the summarized information in Table 2 was obtained.

[1]Authorized for publication on November 22, 1955 as paper No. 2025 in the Journal Series of The Agricultural Experiment Station.

TABLE 1.—OBSERVATIONS ON CHEMICALLY GIRDLED TREES AT THE TIME OF CUTTING

Tree no.	Date cut	Presence of stain in wood	Bark condition	Remarks
	July			
1	7	None	Tight	Top cut into pulpwood. Sept. 6 bark peeled slightly hard.
2	7	None	Tight	Top left intact. Same as tree 1
3	13	Cambium layer showed brown	Tight	Top cut into bolts. Sept. 6 bark peeled satisfactorily.
4	13	Same as No. 3	Tight	Top left intact. Same as No. 3
5	20	Light line of	Slightly loose	Top cut into bolt. Ambrosia beetles in bark. Bolts peeled easily Sept. 6
6	20	Same as No. 5	Slightly loose	Top left intact. Ambrosia beetles in bark. Peeled well Sept. 6
7	27	Sapwood stained ¼"	Peeled better than sap peeling	Top cut into bolts. Beetles deep in bark not in wood.
8	27	Same as No. 7	Same as No. 7	Top left intact. Beetles deep in bark not in wood.
	Aug.			
9	3	Sapwood stained ¼ to ½"	Removal easy	From this date peeling was good for all treated trees. Ambrosia beetles present in sap wood.
10	3	Same as No. 9	Same as No. 9	Same as No. 9
11	10	Through all of	Balance of trees peeled very easily	Beetles ½" or more into sap wood.
12	10	sapwood very light color		
13	16	All sapwood stained but	Bark falls off in skidding	Insects deep in sapwood
14	16	light in color		
15	26	Sapwood stain turning bluish	Same as No. 13	Insects throughout sapwood
16	26	black		
	Sept.			
17	7	Sap stain show	Same as No. 13	Same as No. 15
18	7	ing very dark		

No degrade was found in the lumber from trees which were cut in the first and second week after the treatment. Trees cut the third week after being treated showed a small percentage of defect in the sapwood portion of the lumber while trees cut in the succeeding weeks, with a few exceptions, showed further grade reduction. When comparing the condition initially observed in the logs with the condition of the lumber, there is an indication of the presence of insects in the sapwood portion of the log after the third week. However, in the seventh week, there is no indication of degrade in the lumber. There is an unusual but logical explanation. The jacket boards were cut in such a manner in the seventh week, that the margin of sapwood on the edge was very slight and therefore, the presence of stain and insect holes was not sufficient to degrade the board. The ninth week reflects the opposite situation in which a very large percent of sapwood is present on the jacket board. As an explanation of the above conditions, the thickness of sapwood is different for each log and when combined with varying sizes of logs will cause a difference in the sapwood-heartwood relation in the boards. Since the total volume of each log was small, a relatively large number of boards contained sapwood. The defects caused by the treating of trees did not occur in the heartwood lumber in any of the trees cut, and defect was mostly in the form of pin holes in the sapwood, caused by insects. In the trees cut toward the end of the period, some medium stain which would cause degrade was present, however, all of the stained areas were also full of pin holes.

TABLE 2.—PERCENT GRADE REDUCTION IN LUMBER FROM CHEMICALLY GIRDLED TREES

Length of period after girdling	Lumber volume reduced to lower grade
	Percent
1st week	0
2nd week	0
3rd week	3.7
4th week	8.0
5th week	4.4
6th week	2.2
7th week	0
9th week	18.5
11th week	7.0

System of Grading the Lumber

The lumber was graded in conformity with the "Rules for the Measurement and Inspection of Hardwood Lumber in 1955," as set forth by the National Hardwood Lumber Association.

To determine the loss, the board was first graded on the basis of clear face cutting in all grades of No. 3A common and better, with the exception that stain and pin holes were not classed as defects. This procedure established the original grade of a normal board. The board was then re-inspected with stain and pin holes considered as a defect in conformation to the national rules, and the true grade of the board was established in this manner.

Reduction in Lumber Grade After Three Weeks

The grade reduction caused by the treatment for all trees combined after the first three weeks is shown in Table 3. The original grade is compared to the true grade to show how grades were affected as well as the percentage of grade reduction.

The loss of about 9 percent of what would normally be judged F&S and Selects to some lower grade is sufficient to discourage the use of chemical girdling in trees of average quality. The percentage of loss is not as great in No. 1 grade saw logs because defects other than chemical stain are less serious, consequently a reasonable volume of higher grade lumber can be obtained. In the lower grades logs the proportion of high quality lumber is greatly reduced because a small amount of stain combined with other defects will cause a grade reduction.

The question arises as to whether there is sufficient value in the tops to offset the loss in lumber value when the top can be salvaged for peeled pulpwood. The question can be answered only when the returns of pulpwood profits can be ascer-

tained. Obviously pulpwood has different values in different localities and it might be possible to salvage the tops and have a greater net profit and a cleaner wood lot if values are sufficiently high. In other regions it may be more profitable to leave the tops in the woods and let nature dispose of them, or possibly cut the logs and sell the pulpwood unpeeled. In those localities where unpeeled pulpwood cannot be sold, the possibilities of girdling and treating trees shows some promise of being beneficial when milling phases are confined to the period of the first two weeks after girdling. No grade loss should be anticipated and peeled pulpwood can be secured. To attempt such a program a well-planned operation must be followed.

The other study objectives can also be answered with a reasonable degree of accuracy.

In regard to the question of whether or not bark would peel readily from the tops if trees were cut shortly after chemical treatment, findings indicate that the bark was peeled easily from trees cut a week after girdling and treating. It is not possible to peel the bark immediately after cutting the trees unless a period of four weeks or more have elapsed after girdling. All of the bark peeled very easily from the beginning of the seventh to eighth week after girdling. There is no apparent difference in the peeling properties of trees, regardless of how tops are handled—tops left untouched, tops removed, or the tops cut to pulpwood lengths immediately. With the ease of peeling, it is possible to produce peeled pulpwood in any manner convenient to the operator.

The question of slabs peeling readily so that they can be converted to pulpwood was answered during the course of the investigation. The bark from slabs cut from the first logs peeled as well as the pulpwood bolts which were stacked for a period of about eight weeks. The logs sawed after the seventh week were often peeled when they got to the mill. The logs which did have bark were difficult to saw, as the bark would fall off the slabs and edgings creating a problem in the mill itself. There is some difference in the bark peeling ease noted between trees left standing and those which were cut. After the fourth week the bark peeled easily upon standing trees, but did not peel readily on those already cut. After about the eighth week there was very little difference in the peeling.

Table 3.—Reduction in Lumber Grade Caused by Chemical Girdling

Original grade of lumber	True grade of lumber	Percent of volume reduced to lower grades
F & S	Selects	9.00
Selects	No. 1 common	6.13
Selects	No. 2 common	2.45
No. 1 common	No. 2 common	6.05
No. 1 common	No. 3A common	0.99
No. 2 common	No. 3A common	4.36
No. 2 common	No. 3B common	0.57
No. 3A common	No. 3B common	0.45

As to the question of what percent of grade reduction may be expected out of a total of 3,313 board feet of lumber cut in the test, 138 feet showed degrade or 4.165 percent of the lumber was reduced in grade. All of the degrade present was in the form of a stain or pin holes. The stain seems to be accompanied by ambrosia beetles (*Xyleborus quercus* Hopk.). Whether the stain organism is carried by these insects or whether it enters the wood by other means is not known at present. The same conditions, however, are found on logs which have been cut from untreated trees and left lying in the woods or mill yard for a considerable period of time, and it is possible that the chemical treatment may not be an agent causing this condition. Observations indicate that the stain begins at the cambium layer at a time prior to the insect attack, indicating that hyphae may have grown out of the bark into the wood. More work is planned to study the relationship between the ambrosia beetle and the stain organism, since the beetle remained in the sapwood zone along with the stain organism.

More work will also have to be conducted to see if there is a seasonal influence on the stain and if it might be possible to take advantage of certain seasons to produce both good lumber and peeled pulpwood.

Conclusions

1. If red oak is girdled and chemically treated, lumber should be cut from the logs within a two-week period to avoid grade reduction caused by stain and pin holes.

2. The bark can be peeled from tops of trees cut one week or more after chemical girdling. This holds true for both intact tops and pulpwood bolts produced at the time of felling.

3. Slabs from chemically girdled trees peeled readily after the 4th week when trees were left standing. Bark did not peel well on the slabs from trees cut in the first 4 weeks. After the 8th week there was very little difference between standing and cut trees.

4. There is a definite loss of grade in the lumber produced in trees which have been left for three weeks or more after girdling. This loss varied from 0.45 percent in No. 3A common to 9.0 percent in F & S grades.

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A Check List for Timber Sale Contracts

J. Atwood Whitman
Consulting forester,
Glendon, North Carolina

ON MANY occasions foresters need to understand the contents and operations of timber sale contracts in order to help draft the instruments, review the drafts, or to supervise or check the operations to which they apply. Few lawyers are capable of writing a good timber sale agreement because they do not have the background with which to understand the forestry and logging aspects; foresters as a class lack training in drafting legal instruments, and some attorneys declare that they could be prosecuted if they attempt to do so for others.

The suggested list of provisions enumerated below is designed to help the forester who outlines the draft for the lawyer to put into proper legal form and who has the task of enforcing such contracts.

1. Name and address of buyer and seller.
2. Date of instrument and place of execution.
3. Items bought and sold; species, specifications.
4. Exact location and legal description of the area.
5. Provision for marking boundaries.
6. Declaration of seller's ownership and right to convey.
7. Conditions governing removal.
8. Provision for buyer's ingress and egress.
9. Care of other property: fences, roads, fields, buildings, young trees, reserved timber, telephone lines, wildlife.
10. Provision for liquidated damages.
11. Fire protection.
12. Method and place of scaling or measurement: log rule, lumber measure, stump diameter and height.
13. Price basis: lump sum, price per M bd. ft., price per piece.
14. Method and terms of payment.
15. Duration of agreement.
16. Provision for or against renewal option; price of option.
17. Clause for arbitration in case of disagreement; who pays for same.
18. Provision for close utilization: stump height, maximum top diameter, size of lumber to be sawn.
19. Ownership of by-products: slabs, tops, sawdust, stumps.
20. Statement of whose loss if timber is destroyed or stolen after execution of the contract.
21. Provision for or against assignment of the contract.
22. Financial responsibility of the buyer.
23. Signatures of both parties.
24. Notarization.
25. Registration.

It is obvious that all of the provisions listed here will not be applicable to every timber sale, depending upon the nature of the timber and the type of sale involved. However, most of the provisions can be applied and it is suggested that the entire list be reviewed to be on the safe side.

A few words about each of the items are in order to help safeguard against omissions that might render the contract impotent to carry out important designs of the parties.

1. *Name and address of buyer and seller.*—The obvious reason for this provision is to identify the parties to the contract for legal reasons and so that each party will know with whom he is dealing.

2. *Date of instrument and place of execution.*—Necessary for legal reasons, and a contract must have a period of time within which to operate—a starting and stopping point.

3. *Items bought and sold.*—The mere word "timber" or the phrase "all merchantable standing timber" is rarely sufficient to convey the seller's idea of what he wants to sell. The wording must be specific as to species and sizes. Stump diameter is the only practical dimension whereby the sizes of the trees cut can be controlled. To enable loggers to comply with the stipulated minimum, the stump diameter should be specified outside the bark. In this day of the power saw it should be remembered that stumps are cut very low—particularly in the case of small timber—and that stump diameter should be specified at a point as low or lower than that at which the tree will be severed. There is no point in specifying a diameter above the cutting point that cannot be checked once the logs have been removed.

4. *Exact location and legal description of the area*—More than one buyer has examined one tract of timber and unwittingly bought another. The legal description written into the contract should, as in a warranty deed, describe the sale area by metes and bounds or by the rectangular system of U. S. public land surveys in areas to which they apply.

5. *Provision for marking boundaries.*—The contract should state who is to bear this expense and at what time it shall be accomplished.

6. *Declaration of seller's ownership and right to convey.*—Timber sale negotiations sometimes involve considerable time and expense to the buyer, and he wants to be assured that he is not wasting time and money on something he has no chance of obtaining.

7. *Conditions governing removal.*—Too often such unrealistic phraseology is employed as "perform in a workmanlike manner" or "the timber shall be cut in accordance with sound forestry practices." Such wording is worthless because it is too unspecific to convey the intent of the parties and

cannot be enforced. If the seller wants a certain area logged before the cutter moves to another so that he can enforce slash disposal and other provisions, he must so specify and accurately describe the areas and schedule of operation. He must stipulate that no logging debris is to be left within ten feet of a pine to be left standing, if that is what he intends, rather than employ loose terms that can be given other meanings. It must be stipulated that the buyer, his employees or agents are not to cross any cultivated field of the seller, or portion thereof, with any type of vehicle or logging equipment, rather than "the buyer shall avoid any unnecessary damage to the property of the seller." The logger might well think that a few tracks will not damage a field and that it is necessary that he cross it.

8. *Provisions for the buyer's ingress and egress.*—The buyer must certainly enter and leave the property of the seller in order to harvest and remove the timber he buys. However, the seller can specify areas on which he may not want the buyer to enter, such as not within three hundred feet of his chicken houses with motorized equipment.

9. *Care of other property.*—Here too one must avoid ineffectual wording. Rather than state "the buyer agrees to cause no unnecessary damage to fences and roads of the seller, and agrees to restore them to the same state of repair if he does cause any damage," it would be far better to write "the buyer agrees that in the event fences are cut or broken he will immediately repair them effectively and prevent the escape of any livestock contained therein, and he agrees to restore the existing roads of the seller to a state or condition at least equal to that now existing as depicted by the photographs which have been signed by the parties hereto and which have been attached to and made a part of this contract."

10. *Provision for liquidated damages.*—A pitfall for the seller lies here which should be avoided. Regardless of the wording which might include the statement that declares a schedule of payments in the event of damage to be liquidated damages, one must be sure that such a schedule is in fact not an arbitrary one of penalties set so high as to be a deterrent to commit damage. Such penalties are generally not enforceable. Enforceable liquidated damages are the amounts agreed upon as payment for anticipated losses where the amounts are true pre-estimates of such losses. If trees that have been reserved from the sale are cut and it is stated that the buyer shall pay $30.00 for each said tree, the seller may find it impossible to enforce payment of that amount. But if it can be shown that the commercial value of the tree or the value it had as a shade tree near a building, seed source for future timber crops, or as watershed protection is equal to $30.00, then that sum would be a true pre-estimate of value and hence collectable as liquidated damages.

11. *Fire protection.*—"The buyer agrees to do all within his power to prevent fires on the property of the seller and to surpress same should any occur" will not do the job. Again it is necessary to be specific. The contract should enumerate the restrictions imposed in the use of fire that the seller intends, and it should state that the employees of the buyer, should a fire occur, will immediately cease logging operations and place themselves at the disposal of the seller or his agent for surpression activities at the expense of the buyer.

12. *Method and place of scaling or measurement.*—If the timber products are to be measured as a basis for payment, the log rule to be applied, if any, should be named. Provision should be made as to who shall do the log scaling or lumber measurement, at whose expense, at what place, and to whom and when the reports will be submitted.

13. *Price basis* and 14. *Method and terms of payment.*—These items are almost without exception understood by the parties concerned.

15. *Duration of agreement.*—The expiration date is important to the buyer so that he can plan his operation to harvest all the timber to which he is entitled before having to vacate the premises, and to the seller so that he can start operations which are hindered or prevented by logging. Sometimes it is provided that although the buyer must by a certain date release to the seller all the timber to which he had rights, an additional period of days is granted in which to remove equipment from the property.

16. *Provision for or against renewal.*—This matter should be clearly stated so that the parties can plan accordingly. If a renewal option is provided, the price of the option should be named to prevent a possible source of litigation.

17. *Clause for arbitration.*—Generally, in the case or disagreement, each party to the contract names one person and they agree on a third to settle disputes of a technical nature. If the contract is of long duration it may not be feasible to select the arbitrators at the time of writing the agreement and name them therein, but it is a good plan to do so when practicable.

18. *Provision for close utilization.*—Sometimes it is impractical to comply with stated maximum top diameters where large limbs, knot clusters, or other deformations interfere. Provisions made for these exceptions should be clearly stated. Where payment is based on lumber measure of production, provision should be made whereby one-inch boards are to be sawn in sufficient quantity to prevent waste in excessively thick slabs. Maximum stump heights should be specified, as well as the method of measuring them. If the standing timber is sold on a lump sum basis, the matter of waste is usually of no concern to the seller.

19. *Ownership of by-products.*—It is rarely that the ownership of the tops, slabs, stumps, and sawdust is stipulated in contracts, and the lack of such provision has

caused much dispute and bitterness when local markets for them suddenly developed during the life of the contract.

20. *Statement of whose loss if timber is destroyed or stolen after execution of the contract.*—Fires, hurricanes, ice storms, theft, and other unexpected causes have sometimes materially reduced the volume of a tract during the life of a timber sale contract. Litigation and the resultant expense can be avoided by this provision.

21. *Provision for or against assignment of the contract.*—If the seller definitely wants the party with whom he negotiates to be responsible for performance, he will forbid assignment of the contract in whole or in part. On the other hand, an assignable contract will sometimes command a higher price for the timber and it might be to the advantage of the seller to grant this right. When assignment is permitted, the buyer will sometimes agree to be fully responsible for performance even though he sells his interest in the timber to another.

22. *Financial responsibility of the buyer.*—For the protection of the seller he should compel the buyer to carry personal liability insurance and property damage insurance with stipulated minimums, as well as Workmen's Compensation Insurance during the life of the contract. To insure performance, the buyer is sometimes required to post a cash bond in escrow.

23. *Signatures of both parties* and 24. *Notarization.*—The signatures and notarization constitute execution of the contract.

25. *Registration.*—Despite the importance of legal documents and the care of handling which they deserve, they sometimes become lost or destroyed. Timber sale contracts convey real property and they should be recorded in the public registry at the courthouse.

In conclusion it is well to reiterate that in instruments that convey timber and which control large sums of money, completeness and careful wording are essential.

SCHOOL BOX SCORE 1956 MEMBERSHIP

School	Student applications received: April 1956	Total 1955	Total 1956
Alabama Polytechnic Institute	0	18	6
University of California	0	17	28
Colorado A & M College	3	9	19
Duke University	0	3	3
University of Florida	0	17	3
University of Georgia	2	28	2
University of Idaho	4	4	14
Iowa State College	2	22	8
Louisiana Polytechnic Institute	0	13	12
Louisiana State University	0	43	9
University of Maine	3	12	11
University of Massachusetts	0	11	10
Michigan State University	13	14	25
University of Michigan	0	21	14
University of Minnesota	5	19	23
University of Missouri	1	26	1
Montana State University	1	25	17
State University of New York	0	23	32
North Carolina State College	1	22	2
Oregon State College	6	38	19
Pennsylvania State University	5	32	6
Purdue University	0	24	15
Utah State Agricultural College	1	12	7
University of Washington	2	28	13
West Virginia University	0	26	1
Yale University	1	16	9
Totals	50	523	309

SECTION BOX SCORE 1956 MEMBERSHIP

Section	Applications received[1]: April 1956	Total 1955	Total 1956
Allegheny	9	63	14
Appalachian	3	38	12
Central Rocky Mountain	3	12	19
Central States	0	44	16
Columbia River	11	100	35
Gulf States	3	107	32
Inland Empire	4	10	18
Intermountain	2	18	10
Kentucky-Tennessee	0	9	4
New England	8	50	39
New York	1	33	33
Northern California	0	33	35
Northern Rocky Mountain	2	44	24
Ozark	4	47	8
Puget Sound	4	65	26
Southeastern	4	85	24
Southern California	1	3	1
Southwestern	0	12	0
Upper-Mississippi Valley	7	51	34
Washington	0	2	0
Wisconsin-Michigan	14	40	51
Totals	80	866	435

[1]Student, Junior, Affiliate, Associate (Initial) grades only.

Stand Conditions in the Old-Growth Hardwoods of the Fred Russ Forest in Southwestern Michigan[1]

Victor J. Rudolph
Department of Forestry,
Michigan State University,
East Lansing

IN ORGANIZING the management of hardwood stands in the southern portion of the Lake States and in the Central States, an evaluation of initial stand conditions is usually desirable. An analysis of conditions as they are, coupled with available information on past events which may have brought about these conditions, will often throw much light on future developments to be expected, both as to natural developments, and as to the results of consciously directed efforts by the forest manager. It will serve as a basis for determining the plan of management or research to be applied to the area. Such an analysis has been made for a 40-acre stand of oak and mixed hardwoods in the Fred Russ Forest[2] which is owned and operated by Michigan State University.

The 580-acre forest is located in southwestern Michigan in Cass County near Dowagiac. In addition to areas of forest plantations, an operating forest tree nursery and some second-growth hardwood stands, the forest has a stand of approximately 160-acres of old-growth hardwoods which had been relatively undisturbed for many years (Fig. 1).

The forest has generally level to gently undulating topography. It lies between the inner and outer ridges of the Kalamazoo Moraine, and is drained by Dowagiac Creek. The soil of the area occupied by this 40-acre stand is classified as Miami sandy loam, and was formed in an out-wash plain from sandy drift of glacial origin.

FIG. 1.—General view in the oak-mixed hardwood stand of the Fred Russ Forest. The area has been relatively undisturbed for over one hundred years.

The past history of the stand shows that, in general, the area escaped the severe cuttings to which most of Michigan's forests were subjected. In addition to the salvage of some of the windthrown and similarly injured trees, two cuttings worthy of note are known to have been made in the past. The first of these removed some high quality black walnut logs for export to Germany just prior to the first World War. In the early stages of the second World War, some of the largest and best white oak trees were cut to provide material for the construction of motor torpedo (PT) boats. The stumps and remnants of these trees are present on the area. A few overmature trees were cut within the past 10 years while the area was being used for student instruction. Apparently no damaging fires have occurred on the area within recent times. There is no history or evidence of grazing on the area.

To obtain data on initial stand conditions, a complete inventory of all trees 7.5 inches d.b.h. and larger was made on the 40-acre area.[3] Since this information was to be used in a subsequent long-term hardwood management research project, an assigned number was painted on each tree for future reference. The data recorded for each tree included the following items:

1. Tree number.
2. Species.
3. D.b.h., to the nearest tenth of an inch.
4. Merchantable height in 16-foot logs, to the nearest half-log.
5. Form class.
6. Crown class, by the four

[1]Journal Article No. 1795 of the Michigan Agricultural Equipment Station.

[2]The Forest is named after the late Fred Russ, of Cassopolis, Mich., who donated the area to Michigan State University in 1942. He acquired it in 1935 from the Newton family who had owned it for 99 years. The old-growth hardwood portion of the area has been widely known as the "Newton Woods."

[3]Appreciation is expressed to the Forestry Department staff for assistance in the initial phases of this inventory.

standard crown classes (dominant, codominant, intermediate, and suppressed).

7. Vigor class, according to the four vigor classes used in classifying northern hardwoods.

8. Grade of the butt log of the tree, by the four log grades used by U. S. Forest Service in grading northern hardwood logs (*3*).

9. Cull defect class, based on the six cull defect classes as developed by the U. S. Forest Service (*4*).

In addition, data on the number of trees by species from 1 to 7.5 inches d.b.h. were obtained from a 10 percent sample of the area.

Various groupings of the data thus obtained show a number of significant conditions and relationships within the stand. Customarily, forest stands are most often described in terms of species composition and volume. A complete stand and stock table on a per acre basis is summarized in Table 1.

The net board-foot volume data by d.b.h. class for the three main species and the total stand are presented in Figure 2. At the time of the inventory, the net volume

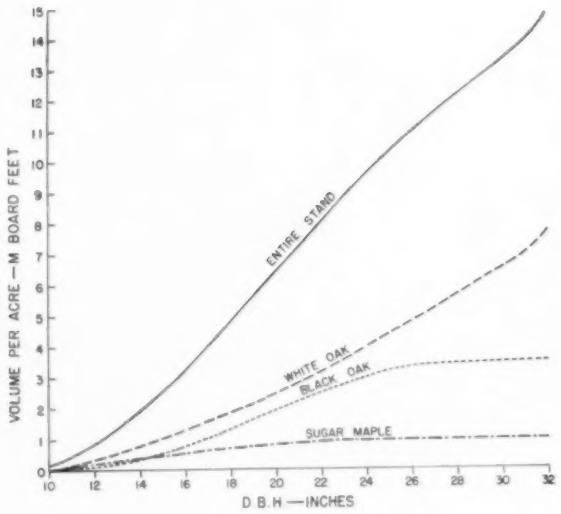

FIG. 2.—(*Left*) Cumulative net board-foot volume per acre.

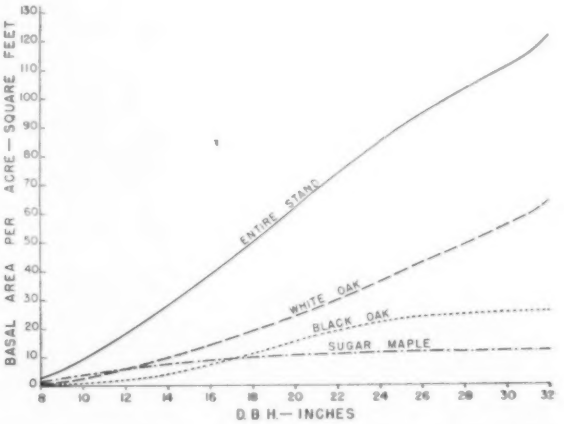

FIG. 3.—(*Above*) Cumulative basal area in square feet per acre.

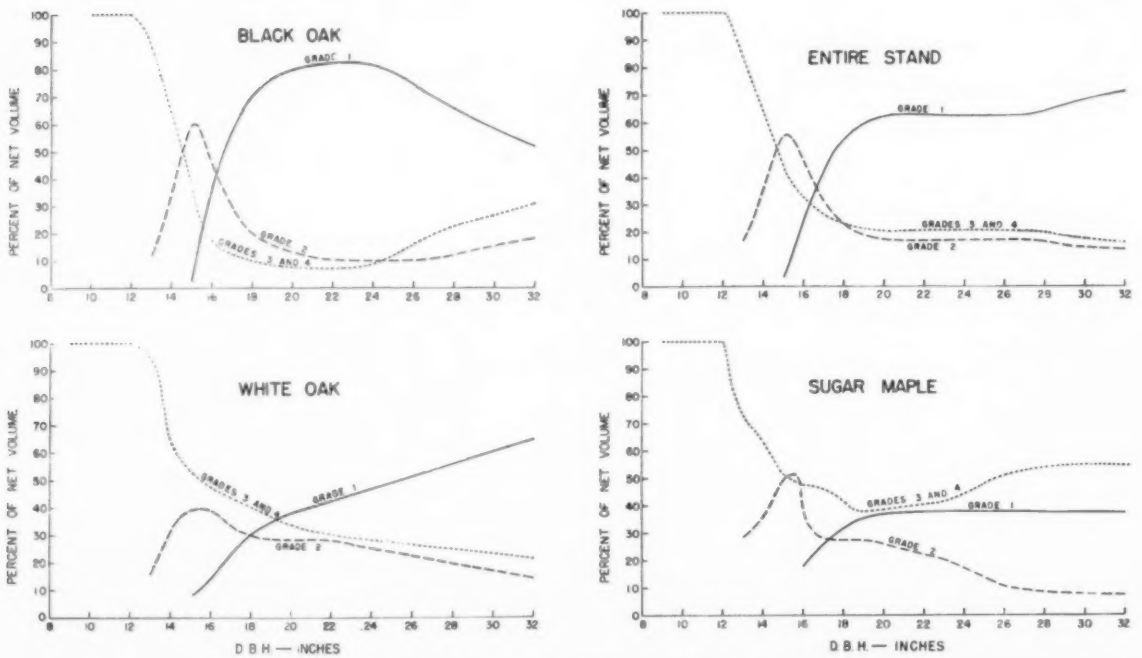

FIG. 4.—Volume-basal area relationships by d.b.h. class.

TABLE 1.—STAND AND STOCK TABLE FOR OAK AND MIXED HARDWOODS, FRED RUSS FOREST, DOWAGIAC, MICHIGAN

D.b.h.	Average no. of trees per acre				Average basal area per acre				Average volume per acre							
									White oak		Black oak		Sugar maple		Entire stand	
	White oak	Black oak	Sugar maple	Entire stand	White oak	Black oak	Sugar maple	Entire stand	Gross	Net	Gross	Net	Gross	Net	Gross	Net
In.					*Sq. ft.*				*Bd. ft.*							
1	—	—	196.54	260.84												
2	—	—	78.54	116.56												
3	—	—	59.80	88.50												
4	.26	—	39.50	55.94												
5	.26	.26	22.80	29.96												
6	.52	.26	16.80	21.94												
7	.26	—	10.30	12.62												
8	1.15	.50	4.33	8.15	.40	.17	1.56	2.88	—	—	—	—	—	—	—	—
9	1.65	.70	3.02	6.98	.71	.30	1.29	2.99	.8	.8	—	—	1.2	1.2	4.1	4.0
10	2.38	.72	1.85	6.38	1.29	.40	1.00	3.44	77.4	72.5	29.6	19.9	63.8	58.4	219.3	195.4
11	2.10	.82	1.53	5.87	1.38	.54	1.01	3.85	110.2	103.8	42.4	39.5	83.7	77.7	310.1	287.9
12	2.30	.85	1.10	5.42	1.80	.66	1.02	4.40	163.0	153.3	64.2	60.0	94.2	87.1	405.9	377.3
13	2.40	1.17	.98	5.53	2.18	1.07	.89	5.04	231.3	217.6	113.3	106.7	99.3	90.2	540.7	505.3
14	2.12	1.08	.90	5.00	2.24	1.16	.94	5.29	270.6	255.2	145.3	136.1	112.5	98.1	643.7	595.9
15	1.73	1.20	.53	4.10	2.11	1.47	.64	5.01	263.1	246.1	191.6	179.3	87.8	78.8	647.1	603.2
16	1.32	1.08	.50	3.50	1.83	1.51	.69	4.86	244.0	230.7	219.3	207.7	98.5	86.4	678.5	630.0
17	1.83	1.33	.35	4.20	2.86	2.07	.55	6.59	379.1	349.2	323.4	306.2	79.2	70.3	947.5	880.3
18	1.37	.82	.30	3.18	2.42	1.45	.53	5.59	305.9	275.3	222.8	209.7	80.5	75.7	802.0	739.1
19	1.25	1.25	.10	2.95	2.44	2.43	.19	5.75	318.7	288.7	384.6	363.2	31.1	26.8	849.1	787.6
20	1.40	1.10	.15	2.92	3.05	2.38	.33	6.35	415.0	370.4	384.9	357.3	52.1	43.4	945.5	850.4
21	.92	.62	.10	2.12	2.21	1.50	.24	5.10	297.2	263.3	243.3	232.4	40.8	31.5	789.3	722.4
22	1.10	.65	.18	2.30	2.88	1.70	.46	6.03	406.1	360.4	296.7	275.1	82.6	69.3	958.0	857.9
23	1.05	.50	.12	1.90	3.02	1.42	.36	5.45	420.7	359.5	241.0	218.3	61.2	48.6	839.5	733.9
24	1.20	.53	—	1.93	3.77	1.65	—	6.05	519.8	444.7	288.1	265.0	—	—	934.1	830.7
25	.80	.43	.02	1.47	2.71	1.43	0.8	4.98	396.2	351.4	234.1	213.3	14.4	13.9	779.4	697.2
26	.98	.15	—	1.18	3.59	.55	—	4.32	523.3	454.4	92.8	79.7	—	—	653.8	570.8
27	.77	.18	—	1.20	3.07	.70	—	4.78	479.2	413.0	112.4	97.9	—	—	790.8	692.7
28	.72	.05	.02	.90	3.11	.22	.11	3.84	501.9	434.2	32.5	24.9	15.4	14.3	640.6	558.2
29	.72	.05	—	.85	3.30	.23	—	3.87	488.0	422.6	35.0	27.4	—	—	581.8	495.8
30	.68	.08	.02	.88	3.31	.38	.13	4.30	521.6	443.8	46.2	36.0	24.8	16.1	684.8	579.3
31	.35	.02	—	.37	1.85	.13	—	1.98	282.7	244.6	23.0	21.4	—	—	305.8	266.1
32+	1.16	.02	.02	1.42	7.36	.14	.14	9.11	1,144.4	987.9	24.7	23.0	24.7	19.3	1,511.1	1,322.5
Total	34.75	16.42	440.40	667.06	64.89	25.66	12.16	121.85	8,760.2	7,743.4	3,791.2	3,500.0	1,147.8	1,007.1	16,462.5	14,783.9

per acre was rather high, averaging approximately 14,800 board feet. White oak (*Quercus alba* L.) constituted half the total net volume of the stand; black oak (*Q. velutina* Lam.) 26 percent; and sugar maple (*Acer saccharum* Marsh.) 7 percent. The combined volume of other species such as red oak (*Q. rubra* L.), red maple (*A. rubrum* L.), black cherry (*Prunus serotina* Ehrh.), American elm (*Ulmus americana* L.), black walnut (*Juglans nigra* L.), yellow-poplar (*Liriodendron tulipifera* L.), white ash (*Fraxinus americana* L.), beech (*Fagus grandifolia* Ehrh.), and basswood (*Tilia americana* L.), made up the balance of 17 percent.

The basal area of the stand showed approximately the same distribution pattern as that of volume (Fig. 3). The basal area of the stand 7.5 inches d.b.h. and larger averaged 122 square feet per acre.

A relationship often used to indicate the soundness of trees of different diameter classes within a stand is the volume in board feet per square foot of basal area. These relationships for white oak, black oak, sugar maple, and all species combined, for both gross and net volume, are shown in Figure 4.

With increasing diameter, the spread increased between the volume-basal area curves for gross and net volumes. This indicates that as tree diameter increased, the amount of identifiable defect in the standing tree increased significantly. Since this stand developed without the aid of management, many trees, especially among the larger sizes, contain considerable defect.

In view of the prevalence of defective trees, it is very likely that net volume conditions in this stand have remained fairly static for some time in the past. Such a condition contrasts with significant volume growth noted in unmanaged but much less heavily stocked stands in the general area (2).

In Figure 4 the downward trend of the volume-basal area curves with increasing tree diameter for black oak and sugar maple indicates that the merchantable height of trees decreased with diameters of 24 inches and larger. Many of these trees are very old, rough, limby individuals, approaching "wolf trees" in their characteristics.

Although it must be kept in

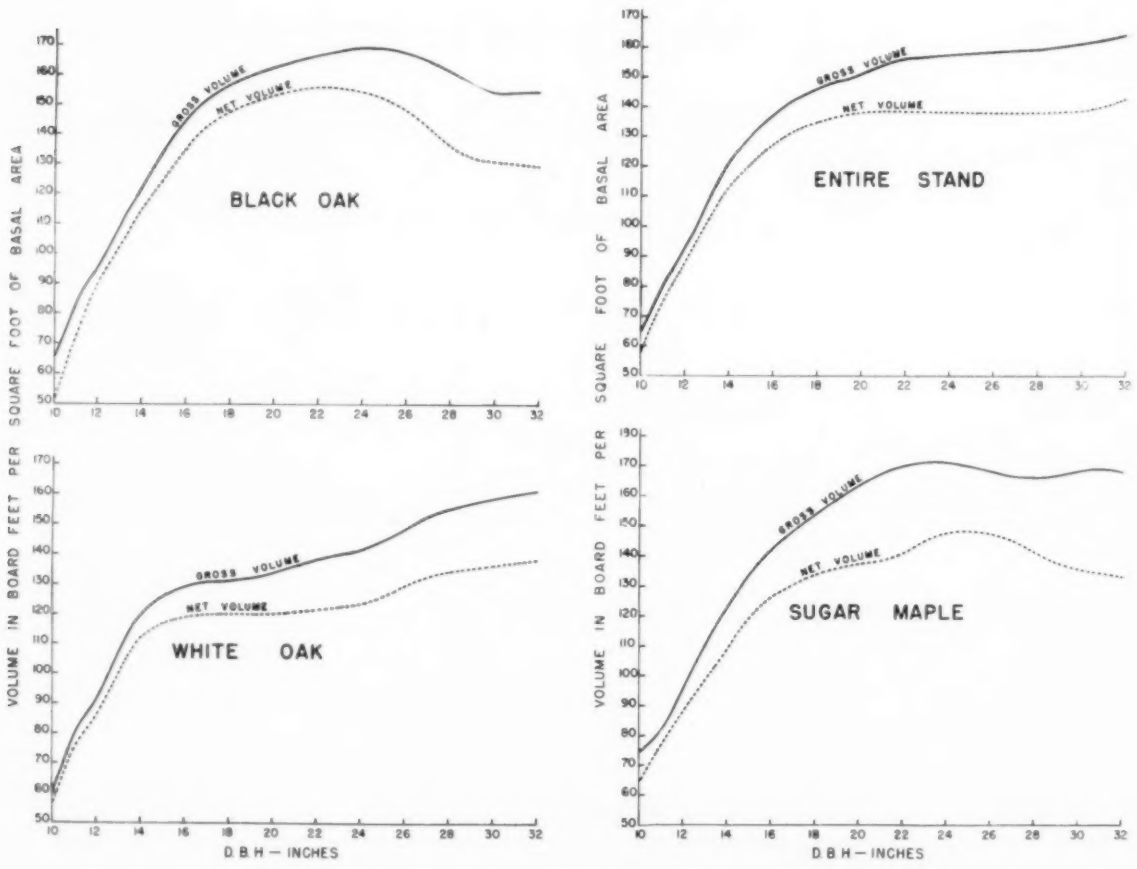

FIG. 5.—Percent of net volume per acre by grade of the butt log of the tree.

mind that this is an unmanaged stand, the approximate maximum size is indicated to which black oak and sugar maple in similar stands should be grown. This size could be considered as the diameter at which the volume-basal area curves culminate.

The quality composition of the stand is shown in Figure 5. For the entire stand, the volume of trees with a grade 1 butt log formed a high percentage of the total volume in each diameter class above 16 inches. The data for white oak show a fairly constant increase in the percentage of volume in trees with a high quality butt log as the diameter increased. For black oak, the data show that in trees larger than 22 inches in diameter, the quality of the butt log decreased rapidly.

Of the three most important species composing the stand, sugar maple was of the lowest quality. The percentage of volume in trees with a grade 1 butt log remained fairly constant with increasing diameter, while the grade 2 quality trees decreased in importance. This lowered the overall quality aspect of the species as tree size increased. Thus, the size-quality relationship for black oak and sugar maple substantiates the indication of the volume-basal area relationship, namely, that in general, these species should not be grown to sizes larger than 22 to 24 inches d.b.h. (*1*).

The species composition as listed in Table 1 is shown graphically in Figure 6. The diameter distribution of all species combined is fairly characteristic of that usually associated with an irregular or uneven-aged stand. However, the data for the three most important species—white oak, black oak and sugar maple—show large differences in the distribution of trees by diameter class. No oak trees below 4 inches d.b.h. occurred in the stand. On the other hand, the abundance of sugar maple increased tremendously in the smaller diameters. Approximately the reverse is true in diameters above 23 inches. A fairly uniform representation of the oaks was maintained in the larger sizes, while there are practically no sugar maple above 23 inches d.b.h.

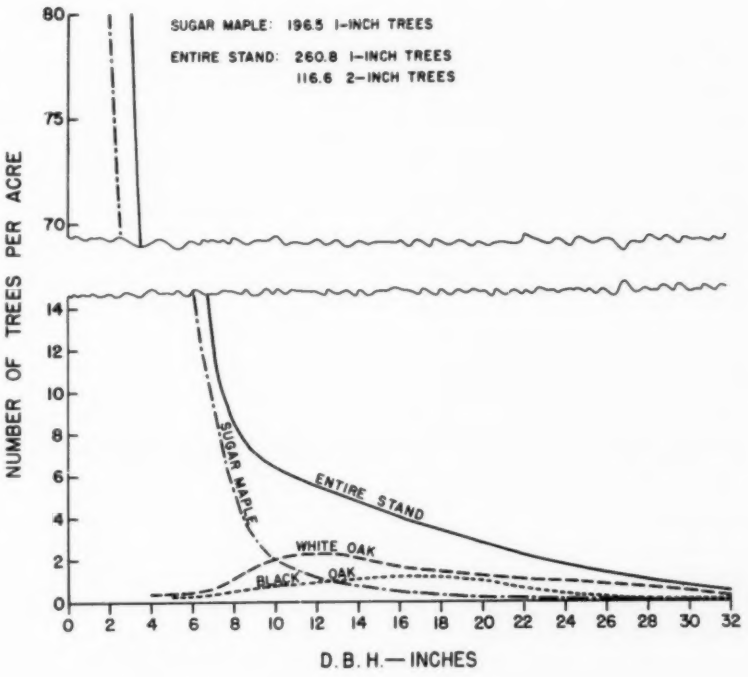

Fig. 6.—Number of trees per acre by d.b.h. class.

The implications of these data are unmistakable. The composition of this stand has been and still is undergoing significant change. Developments in the future, if allowed to continue their present course, will most probably result in a stand dominated by sugar maple. If losses of the larger overmature oaks continue in the future as they have in the past through decadence, windthrow, or light infrequent cuttings, the importance of the oaks in the stand composition will continually decrease. Practically no oak trees appear to have become established in the stand during approximately the past 100 years. In the meantime, increasing numbers of sugar maple have been added to the stand composition.

The question arises as to the origin of the oaks in the present stand. It is likely that a major catastrophe of some kind, such as a severe fire, or a fairly complete blowdown occurred on the area from 150 to 200 years ago. That event left the area in a condition favorable for the establishment and development of an originally fairly even-aged stand predominantly of white, black, and red oak. Since then, conditions within the stand have not been favorable for the establishment of additional oak trees. The very tolerant sugar maple has been able to cope much more successfully with the existing stand conditions than the intermediately tolerant oaks.

If the oaks are to be maintained as a significant component of this stand in the future, it appears that fairly drastic changes must be brought about in stand conditions. Considerable opening of the stand will be necessary to bring about changes favorable for the establishment, growth, and development of oak reproduction. Such necessary marked changes undoubtedly can be brought about through the application of the heavier types of cuttings such as the group selection method or the shelterwood method.

Summary

An analysis of conditions in this oak-mixed hardwood stand showed rather high volume and basal area per acre, an increasing amount of defect in the larger trees, and large differences in the quality of trees of various diameters of different species. The diameter distribution and numerical importance of species in the stand indicate that its composition is changing from oak-mixed hardwoods, toward more sugar maple and less oak. Modification of existing stand conditions, most likely by cuttings, will be required to encourage establishment of oak reproduction on the area.

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Federal Taxation of Income from Timber[1]

Roger D. Huff
Forest valuation engineer,
Internal Revenue Service,
U. S. Treasury Department,
Atlanta, Georgia

ALL professional foresters are concerned with federal income taxes, at least to the extent that we are required to file an income tax return not later than April 15.

Furthermore, foresters, especially those engaged in forest management work, have more than a personal interest in income taxes. Foresters are often called upon to furnish advice and information relating to taxes on timber income. This information may relate to timber estimates, allocation (or apportionment) of cost at time of purchase (or acquisition) to land, timber, and other elements of value, determination of fair market value of timber, etc. In addition, foresters engaged in the management of timberland are directly concerned with federal income taxes which must be considered in determining profits (or net results) from forest activities. Also, foresters in federal and state employ, together with consulting foresters are often confronted with income tax questions and it certainly can do them no harm to be in position to furnish correct advice.

The Internal Revenue Service is charged with determining, assessing, and collecting the correct amount of taxes in accordance with the Internal Revenue Code and the Treasury regulations relating to income taxes imposed by the Code. In other words, the Internal Revenue Service is interested in collecting the correct amount of tax due, not more, not less.

Due to the complexity of the income tax laws, taxpayers receiving income from the sale of timber and forest products often have questions and problems with respect to reporting their income and computing the correct tax. Although based on reason and logic, income tax laws are complex because in order to afford similar treatment to all taxpayers, they must be written so as to cover a multitude of situations, using such language as will prevent circumventing the law and the intent of Congress. Therefore, many problems arise for which the taxpayer must seek assistance in order to comply with the law.

If the taxpayer employs competent accounting service, his accountant should be able to furnish the proper solutions to his problems. However, taxpayer assistance is available at the local Internal Revenue Service offices or may be obtained by writing to the district director of Internal Revenue for his district. In the case of controversial questions, the taxpayer may request a formal ruling through the district director. In any case, the taxpayer reporting income from timber sales should be able to file his return correctly if he will inform himself by seeking advice through the Internal Revenue Service, accountants, and others qualified to advise him.

The following references also contain much helpful information:

Your Federal Income Tax, published annually by the Internal Revenue Service and obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. for 25 cents.

The Small Timber Owner and his Federal Income Tax, Agricultural Handbook No. 52, prepared by the Forest Service, U. S. Department of Agriculture. For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. 20 cents.

Federal Income Tax Tips for the Small Timber Owner, an 8-page brief published by the U. S. Forest Service and available free of charge from the U. S. Forest Service, State Forest Services, and county agent's offices.

Tax Treatment of Timber Cutting under Section 117(k)—The Internal Revenue Code by Chas. W. Briggs. Available from the Forest Industries Committee, 1319 Eighteenth St., N. W., Washington 6, D. C.

[1]Presented at a meeting of the Appalachian Section, Society of American Foresters, Durham, N. C., January 27, 1956.

Timber Depletion

Timber depletion is directly related to the determination of taxable income and the filing of proper returns. Depletion is simply the reduction or exhaustion of an asset such as timber and other natural resources. In a fashion it is the matching of cost against income derived from the sale thereof. In other words depletion is to natural resources as depreciation is to physical assets which have definite and determinable lives.

In the case of timber, the basis for depletion represents the original cost of the timber adjusted for any reductions or additions. As in the case of depreciable property, the cost of timber must be capitalized. Instead of recovering the cost over the useful life, as in the case of depreciable property, the investment in timber is recoverable only as the timber is cut or sold, depending on the circumstances. For income tax purposes, depletion is allowable as a deduction from income and is based on two factors: (1) the adjusted basis which is the remaining cost, or the original cost adjusted for additions due to purchases or expenses, which may be capitalized, and reductions due to depletion allowable or allowed in previous years because of cutting, casualty losses, etc., and (2) the estimated volume of timber available; for instance, the original estimate at the date of acquisition corrected for any changes resulting from cutting, growth, and losses due to fires, insects, theft, etc.

The allowable depletion in any year in which cutting is done is determined by making a computation which involves dividing the adjusted cost of the timber by the adjusted quantity to determine the unit rate of depletion. This unit rate multiplied by the number of units cut results in the amount of the cost which can be taken as a deduction from gross income in that year.

To the income tax return of all taxpayers claiming a deduction for depletion or depreciation or both there shall be attached a statement known as Form T (Timber). Form T (Timber) requires the following:

(a) Description of, cost of, terms of purchase or lease of, timber and land acquired;

(b) Proof of profit or loss from sale of capital assets;

(c) Description of timber with respect to which claim for loss, if any, is made;

(d) Record of timber cut;

(e) Changes in each timber account as the result of purchase, sale, cutting, re-estimate, or loss;

(f) Changes in physical property accounts;

(g) Operation data with respect to raw and finished material handled and inventoried;

(h) Unit production costs; and

(i) Any other data which will be helpful in determining the reasonableness of the depletion or depreciation deductions claimed in the return.

Although the income tax regulations require this statement, in case of the small individual taxpayer, a depletion schedule, with sufficient details to determine whether or not the claim is reasonable, has been accepted in the past in lieu of Form T, and likely will be accepted in the future. However, in the case of larger individual owners, lumber companies, timber holding companies, pulp companies, and others with numerous transactions each year, Form T (Timber) is required; and even if it has not been previously filed the taxpayer is likely to be requested to do so if and when his return is examined by an agent of the Internal Revenue Service.

In recent years there have been few developments or changes which directly affect the taxation of timber income. However, a revision of the Internal Revenue Code became effective for most purposes with the beginning of the year 1954. This is known as the 1954 Code. As far as timber income is concerned, one important change in the new law concerns the treatment of income from the disposal of timber, and will be discussed later in connection with capital gains and losses.

The foregoing explanation regarding depletion is important to an understanding of the following discussion concerning the treatment of timber income for tax purposes.

Income from Timber

Receipts from the sale of timber must be reported as ordinary income which is fully taxable, or if eligible may be treated under the capital gains provisions which usually results in a tax saving. In order to take advantage of the benefits afforded by treatment as capital gain, it is first necessary for the taxpayer to determine whether his timber receipts constitute ordinary income or whether they can be treated as capital gains or losses. This determination is fairly simple in most cases if all the facts are known. Anyone who has income from, or expects to receive income from, the sale of timber should make an effort to inform himself so as to be able to determine whether his receipts must be reported as ordinary income or whether they are eligible for beneficial tax treatment under the capital gains provisions.

Generally speaking, receipts from sales of standing timber "held for sale to customers in the ordinary course of his trade or business" and those from the sale of timber held or owned 6 months or less must be reported as ordinary income. The first situation is considered to apply to timber dealers who are in the business of buying and selling timber or timberland, but not to farmers or investment owners who make occasional sales. The second situation is self-explanatory inasmuch as the law prescribes that income from the sale of capital assets including timber, which are held for 6 months or less, shall be reported as short-term capital gains and losses. This type of income is taxed at ordinary income tax rates.

In addition, proceeds from the sale of forest products, such as logs, lumber, poles, piling, mine timbers, cross ties, pulpwood, fence posts, and fuel wood, must be treated as ordinary income. Also, receipts from the sales of products harvested from standing trees, such as naval stores, maple syrup, bark, fruit, nuts, oil, or Christmas greens,

must always be treated as ordinary income.

Ordinary income from the sale of timber is fully taxable along with any other income of the taxpayer at the rates applicable for the year for which the income tax return is filed. The tax on timber receipts reportable as ordinary income could be very high if the taxpayer had considerable other income in addition to a sizable income from sales of timber. The chances are, however, that if the timber had been held less than 6 months, the depletion allowance would offset a large portion of the gross income leaving a relatively low taxable net income unless the taxpayer had happened upon a bargain which produced a high percentage of profit.

Except for the foregoing situations timber receipts will normally be eligible for capital gains treat ment. The treatment of income as capital gains results in tax savings. In the case of an individual, 50 percent of the capital gain—the difference between the gross sales price and the cost or other basis—is recognized for tax purposes. Remember that if income must be reported as ordinary income the entire profit is fully taxable along with other income. In the case of a corporation capital gains are taxed on the basis of a 25 percent rate whereas the ordinary income rate is 52 percent. In other words, a tax saving of 50 percent or more may result from the capital gains treatment of income.

There are three situations in which timber receipts can qualify for capital gains treatment:

1. Lump sum sales of timber which has been held more than 6 months. Since timber is a capital asset, sales of this type have been eligible for such treatment ever since the capital gains provisions have been in effect.

2. Receipts from timber held for more than 6 months which is sold on a pay-as-cut basis are eligible for capital gains treatment under Section 631(b) of the 1954 Internal Revenue Code. The law provides that the disposal of timber held for more than 6 months, before such disposal by the owner thereof under any form or type of contract by virtue of which the owner retains an economic interest in such timber, shall be considered as a sale of such timber, and the difference between the amount realized from the sales and the depletion basis shall be considered as though it were gain or loss. Under this section, the date of disposal is the date of cutting, unless the owner under the contract receives payment prior to the cutting date, in which case the date of payment may be considered to be the date of disposal. Under this section "owner" means any person who owns an interest in the timber including a sublessor and the holder of a contract to cut timber.

The foregoing section provides additional benefits over the previous law which was known as Section 117(k)(2). Under the 1939 Code, the date of disposal was restricted to the date of the contract, and the benefits were limited to the owner of the timber.

3. When a taxpayer cuts timber which he owns or has a contract right to cut and sells the products, all the profit must be reported as ordinary income, unless he takes advantage of the benefits afforded by Section 631(a) of the 1954 Code, formerly Section 117(k)(1) in the 1939 Code. Under this section, the taxpayer may elect in his return for the taxable year to treat the cutting of timber (for sale or for use in his trade or business), during the year in which he has owned or had a contract right to cut at least 6 months prior to the beginning of his taxable year, as a sale or exchange of such timber cut during the year. If this election has been made, gain or loss to the taxpayer shall be recognized as the difference between the fair market value of the timber on the first day of his taxable year and the adjusted basis for depletion of the timber cut. If a taxpayer makes an election under this subsection of the code, the election applies to all timber which is owned by him or for which he has a contract to cut. Furthermore, he will be required to report all of the timber cut which is eligible for treatment under this law, not only in the year the election is made but in all subsequent years, unless the Secretary of the Treasury or his delegate, on the showing of undue hardship, permits the taxpayer to revoke his election.

The election actually amounts to a fictitious sale in which the taxpayer sells timber to himself and reports the increase or decrease in value over cost as a gain or loss. For purposes of determining the tax on timber cut under this section, the fair market value becomes the cost for all purposes for which cost is a factor. This means that the fair market value is substituted for the adjusted depletion or cost figure in determining net income. The capital gain or loss under this method of handling income is aggregated with the gain or loss on other capital assets for the taxable year and the tax computed on the net gain.

Fair Market Value

The chief problem remaining involves the determination of fair market value of timber cut. The Internal Revenue Service requires that the fair market value be reasonable, and the taxpayer is held responsible for substantiating the fair market value as claimed. To substantiate the fair market value, which is defined as "the cash price a willing buyer would pay a willing seller, both being informed as to the facts," there are several types of evidence to which the Internal Revenue Service will give consideration. The following are generally accepted:

1. Sales of comparable timber on or near the valuation date adjusted for any differences as to species, logging cost, hauling distances, timber sizes, etc. The average of several transactions including those of the taxpayer and others in the general area of the taxpayers operation, results in much stronger evidence than just one sale.

2. Theoretical or analytical appraisals in which the amount remaining after deducting costs of cutting, hauling, processing, and a

reasonable profit from the gross sales price of forest products, indicates the stumpage price. Appraisals are very useful as a guide in arriving at reasonable fair market values.

3. Market values established for other purposes such as those in connection with estate and gift taxes are often strong evidence.

4. Opinion testimony is usually weak evidence in establishing fair market values because of bias. However, opinion evidence may be helpful in determining fair market values especially from the standpoint of furnishing facts. Whether the income is treated as ordinary income or capital gains may be very important from the standpoint of the tax bill. Therefore, the keeping of accurate records in connection with timber property cannot be emphasized too strongly.

The small owner who does not have a bookkeeper or accountant need not keep a complicated set of books, but he should maintain a record of facts and details regarding his timber business. Included should be an accurate record of all expenses and transactions, including purchases, sales, estimated quantities of various types of timber purchased by tracts, quantities lost due to fire or other casualty, quantities sold, total cost of timberland, cost allocated to timber, land and other elements of value, date of each transaction, names and addresses of buyers and sellers involved, etc. Such information is necessary in reporting income under the capital gains provisions and in claiming deductions for depletion. There have been cases when the taxpayer could not substantiate his income as capital gains, and as a result was taxed on the basis of ordinary income. This can be costly.

Summary

Summarizing this discussion of the treatment of income from sales of timber, the important points to remember are:

1. Profit on the sale of timber will be taxed as ordinary income if it has been held less than 6 months, or if the taxpayer is a timber dealer.

2. The profit from timber sales may be eligible for capital gains treatment if it has been held for more than 6 months and is sold on a lump sum basis or pay-as-cut basis. If sold on the latter basis it would have to qualify under Section 631(b) of the 1954 Code.

3. Under the provisions of Section 631(a) of the Code, a taxpayer who does his own cutting may elect to treat the cutting of timber held more than 6 months prior to the beginning of his taxable year as a sale or exchange of timber, if the timber is sold or used in the taxpayer's trade or business. In this case the difference between the fair market value of the timber as of the first day of the taxable year and the adjusted basis or allowable depletion is reported as capital gain or loss. For the purposes of this law, timber includes Christmas trees more than 6 years old.

Milwaukee Chapter Makes Merit Badge Clinic Continuing Project

The Milwaukee Chapter of the Wisconsin-Michigan Section, S.A.F., participated during 1955 in a Forestry Merit Badge Clinic in cooperation with the local council of the Boy Scouts of America. Reaction was so favorable that plans call for repeating the clinic annually.

Three hundred Scouts and Explorers participated. The clinic was divided into an evening indoor session at which preliminary instructions and examinations on two of the seven merit badge repuirements were given and an outdoor session at which the boys were instructed and examined on tree measurements, tree identification, fire control, tree planting, and tree pruning.

Each Scout was given a kit of materials at the indoor session which contained material and instructions for making a diameter tape and a hypsometer. These tools were completed by the outdoor sesion and each Scout used them to actually measure trees. The Scouts planted 4,000 seedlings to meet the requirement for tree planting, pruned evergreens in the state forest plantation, built a fire lane around the tree plantation and identified the various kinds of trees to be found in the forest to complete all of the requirements for the forestry merit badge.

This program was under the direction of Mr. Herman Olson of the U. S. Forest Service. Mr. Clyde Smith, chief forester of the Kettle Moraine State Forest, coordinated the activities for the outdoor session.

Reports of the project indicated that careful advance planning and active participation by Chapter members contributed to its success. This is an excellent example of one way in which Society members can inform and interest young men in the profession of forestry.

Can the Shelterwood Method Successfully Regenerate Longleaf Pine?

Thomas C. Croker, Jr.
Southern Forest Experimental Station,
Forest Service,
U. S. Department of Agriculture

The author suggests that the shelterwood system may offer a solution to the difficult problem of regenerating longleaf pine.

"DELIBERATE regeneration of longleaf pine has been rarely accomplished."

Wahlenberg's (*9*) understatement highlights one of the hardest problems in southern forestry. A reliable formula for consistent reproduction of longleaf pine (*Pinus palustris* Mill.) has not been developed. Good seedling stands have usually resulted from a series of unplanned circumstances rather than from a forester's prescription. The seed-tree method is most frequently used, but even when seed tree cuts are followed by an adequate seed crop, failure is the rule rather than the exception. Birds and rodents often eat the seed before it germinates, or the seedlings may be wiped out by drouth or fire in their vulnerable first year. Then a long period of waiting usually ensues, during which hardwoods gain the upper hand and pine growth per acre is low.

On the Escambia Experimental Forest in southern Alabama, some good stands have been established where advance reproduction was released by the timely harvest of a thick overstory in a manner that resembled the removal cut in a shelterwood system. This and related experience suggests that the shelterwood method may circumvent many of the disadvantages of the seed-tree system. Particularly, it would maintain a well stocked overstory until adequate regeneration was firmly established.

Good Stocking from Advance Reproduction

In 1947, a bumper crop of longleaf seed fell in Alabama—according to De Vall (*4*) the heaviest since the virgin timber was cut. Weather in the spring of 1948 was favorable, and an excellent stand of reproduction was established throughout the Escambia Experimental Forest, even under relatively dense stands.

Beginning in December 1948 and continuing through 1951, three 40-acre compartments were cut back to seed trees each year—a total of 12 compartments. The cutting, done as part of a larger experiment, was very similar to removing a shelterwood after reproduction has occurred. An average of 67 trees per acre were removed—44 in sizes from 4 to 10 inches d.b.h. and 23 larger. Only eight seed trees (over 9½ inches d.b.h.) were retained per acre.

Logging damage to advance reproduction was negligible. Logs and poles were skidded into piles with mule teams, usually one truckload to the pile. Trucks were driven to these piles and loaded. Pulpwood trees were cut into sticks where they fell and the wood was loaded directly on trucks by hand.

In the summer of 1948, shortly before the first compartments were cut, a seedling stocking survey was made. Fifty mechanically selected milacres were examined on each compartment. Milacres with one or more pine seedlings were classed as stocked; seedlings were mostly from the 1947 crop. Follow-up surveys were made in 1952 and 1954. In 1952, milacres stocked only with 1951 seedlings were distinguished from those stocked with seedlings from other years. Most of the post-1947 seedlings originated from the light seedfall of 1951.

In 1948, all 12 compartments had adequate reproduction, and on some the stocking was excellent. The fate of this reproduction was determined by the timing of overstory removal. The 1952 survey showed that milacre stocking in compartments cut back to seed

FIG. 1.—These longleaf seedlings came in as advance reproduction under a stand that resembled heavy shelterwood. As soon as the seedlings were established, the overstory was removed.

trees in 1948 (a year after the bumper crop) had declined only 10 percent (Table 1). Today these compartments have an excellent stand of young pine (Fig. 1). Seedlings released before they were 2 years old also fared well. But on compartments where cutting was delayed for 3 or 4 years, milacre stocking was drastically reduced.

Today's stocking is composed largely of advance reproduction from the 1947 seed crop. The 1947 advance reproduction, as tallied in 1952, was almost identical with the total stocking found in 1954. Between 1952 and 1954 the well-stocked compartments retained most of their seedlings, and the poorly stocked ones failed to make up their deficits.

Establishment of well-stocked longleaf stands from advance reproduction has occurred before. P. M. Garrison, chief forester of the Gaylord Container Corporation, reports in correspondence that several thousand acres of very satisfactory longleaf originated under the virgin timber at Bogalusa, Louisiana. Fire protection and fortuitous release when the virgin timber was clear-cut served to establish these stands.

Table 1.—Seedling Stocking on Escambia Experimental Forest, as Affected by Time at Which Advance Reproduction was Released

Years between 1947 seedfall and seed-tree cut	1948 stocking, total[1]	1952 stocking		1954 stocking, total
		Advance reproduction[2]	Seed-tree reproduction[3]	
	Percent of milacres stocked			
1	93	83	8	84
2	83	76	5	63
3	72	35	5	37
4	90	52	9	52

[1]Mostly from 1947 seed crop.
[2]From all seed crops prior to 1951, but mainly advance reproduction from 1947 crop.
[3]Fill-in reproduction from 1951 crop only.

Infrequent Cone Crops Cause Long Regeneration Periods

A chief risk of the seed-tree method is that unless a good cone crop is already present when the stand is cut back to seed trees, many years may elapse before adequate seed is produced.

Wahlenberg (*9*) reports that good crops usually occur every 5 to 7 years but that bumper crops, which are less frequent, are needed to feed wildlife and simultaneously establish reproduction. Maki (*7*) suggests that usable crops may occur at less than 5-year intervals in south Mississippi, barring drouth and assuming optimum management. Drouths, however, are common on sites usually assigned to longleaf, and the seed crop frequency that Maki found may not be repeated elsewhere. Artificial means of stimulating seed production show promise, (*1, 5*), but have not yet been developed to the point of practical application.

During good seed years released trees will bear more seed than unreleased trees. But release must be timely. On the Escambia compartments, maximum cone production by the residual seed-tree stand did not occur until at least 3 growing seasons had elapsed. Figure 2, which is based on cone counts from 20 mechanically selected trees in each of the first 9 compartments to be cut, shows how release affected the 1951 cone crop. Cone production was poorest on compartments cut in 1950, 8 months before seedfall, and best on those released in 1948, 32 months prior to seedfall. Release at 20 months was considerably less beneficial than release at 32 months. Since 1951, seed crops have been light despite release.

Clearly, release of seed trees cannot always be timed accurately enough to ensure a maximum seed crop. At least three years of release are needed for best seed production, while good seed years cannot be foreseen more than 2 years.

Seed Tree Versus Shelterwood

It is obvious from the foregoing that stands may remain in a seed-tree status for extended periods before reproduction is established. How serious is this?

Chapman (*3*) and others have shown that the growth rate of individual seed trees increases after logging. But seed tree stands are understocked and increment per acre is low. For example, the three compartments that were cut back to seed trees in 1948 grew at the rate of 5.7 percent annually for the next five years. However, their per-acre volume was only 189 cubic feet (inside bark), and annual net growth was less than 11 cubic feet. Three similar forties that had been given light improvement cuts grew at about the same rate—6.0 percent—but these produced 41 cubic feet per acre on a growing stock of 684 cubic feet.

Another disadvantage of extended periods of seed-tree status is the serious invasion by undesirable vegetation. Scrub oaks, dogwood, and shrubs are common understory associates of longleaf. If released before pine regeneration is established, these scrubs will increase rapidly in number and size, and the ultimate cost of controlling them and establishing pine will increase in proportion.

If the hardwoods are controlled before pine is established, native grasses may take over (*10*). In fact, grass is likely to prove troublesome after any heavy cutting, even when a prompt catch of pine is secured. On the Escambia Forest, cutting back to seed trees was followed by a heavy increase in grass production. Prescribed burning of grass roughs of course

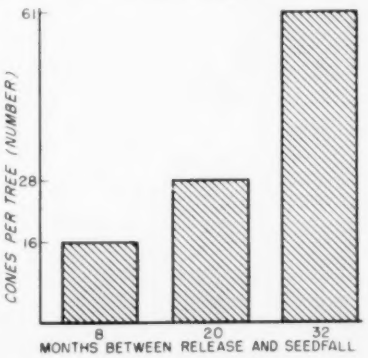

Fig. 2.—Effect of time of seed-tree release on cone production. Escambia Experimental Forest, 1951.

helps the germination and establishment of longleaf pine, but the sod inevitably recovers and delays height growth (*8*).

Birds usually consume enough longleaf seed to affect reproduction seriously (*2*). Since they are most numerous on open land (*6*), they probably cause larger losses in seed-tree stands than on better stocked areas.

In the present state of knowledge, the shelterwood method would seem to offer a way of avoiding or mitigating some of the hazards just enumerated. By this system, a mature stand would be opened up enough to stimulate cone production, but considerable growing stock would be retained. When adequate reproduction was established, the overstory would be removed promptly, before it materially reduced the stocking and vigor of the new stand. Under such a procedure, merchantable growth per acre would be kept relatively high and the invasion of undesirable vegetation would be inhibited until pine reproduction was virtually assured.

There are, however, a number of questions that must be answered before a longleaf shelterwood system can be recommended for general use.

What residual stand will produce enough seed and still grow an acceptable volume of wood per acre per year?

When should the overstory be removed? How do differences in overstory density affect the required timing of removal?

Can the overstory be safely removed in one cut? What logging precautions are needed to minimize damage to the reproduction?

Answers to these and related questions will be the object of regeneration studies on the Escambia Experimental Forest.

Summary

In south Alabama and elsewhere, good stands of longleaf pine have been accidentally established by the release of advance reproduction. The circumstances resembled shelterwood cutting and suggested that this system might be a practical way of regenerating longleaf.

Shelterwood, in contrast to the commonly used (and commonly unsuccessful) seed-tree system, would keep a productive stand of pine on the site until regeneration was assured. The seed-tree method depends on timing the cut to take advantage of a bumper seed crop. Since such crops are infrequent, failure to secure a prompt seedling catch generally involves a long waiting period during which pine increment is low and competing vegetation takes over the site.

Longleaf shelterwood must, however, remain a hypothesis until more information is secured on methods of applying it.

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Testing Soil-Site Index Tables in Southwestern Alabama

Earl J. Hodgkins
Associate professor
Department of Forestry
Alabama Polytechnic Institute, Auburn

In recent years, a series of regression studies have been made throughout the Southeast for the purpose of relating height growth and site indices to environmental factors for the four major species of southern pines (longleaf, *Pinus palustris* Mill.; slash, *P. elliottii* Engelm.; loblolly, *P. taeda* L.; and shortleaf, *P. echinata* Mill.). These studies have emphasized relationships between height growth and certain soil physical factors. Usually the prediction equations developed have been converted to tables to be used in determining soil-site index[1] in the field. It may be assumed that each table is broadly applicable throughout the region represented by sampling. Applicability to specific localities and stands, however, must be tested. Local relationships, even though fitting within regional trends, may exhibit trends more or less peculiar to themselves.

Soil-site index prediction for longleaf pine presents a special problem in Alabama because none of the sample data used in the two basic studies was obtained from within this state. It is therefore desirable to test the three soil-site index tables involved for possible applicability to Alabama conditions.

This paper reports a study that tested the application of soil-site index tables to longleaf, slash, and loblolly pine stands in Baldwin, Escambia, and Monroe counties in southwestern Alabama. The data were gathered by forestry students of the Alabama Polytechnic Institute during the summers of 1954 and 1955.

Soil-Site Index Tables Tested

Ralston (*10*) studied longleaf pine in the Carolinas, Georgia, and Florida. On well drained soils, he found that age, stocking, moisture equivalent of the subsoil, latitude, and turpentining were significantly correlated with site index. On imperfectly to poorly drained soils, he found that age, stocking, moisture equivalent of the subsoil, depth to mottling, and latitude were correlated with site index. On the basis of a significant relationship between moisture equivalent and silt plus clay in the subsoil found by Ralston, Coile (*3, 4*) developed Tables 1 and 2 for field use in obtaining soil-site index. Table 1, for well drained soils, merely requires a determination of subsoil texture and a rough estimate of stocking. Table 2, for imperfectly and poorly drained soils, requires determinations of texture

Table 1.—Site Index of Longleaf Pine on Well Drained Soils in the Southeastern Coastal Plains as Influenced by the Texture of the Subsoil[1]

Subsoil characteristics		Site index	
Texture	Moisture equivalent (Percent, wt. basis)	Well stocked stands[2]	Poorly stocked stands[2]
Sands	2.7	64	58
Loamy sands	6.9	65	59
Sandy loams	13.3	66	60
Sandy clay loams	19.3	68	61
Sandy clays	25.0	72	62
Light clays	30.0	76	63
Heavy clays	35.0	77	64

[1]From Coile (*4*).
[2]The dividing point between "well stocked" and "poorly stocked" stands is 50% of full stocking.

Table 2.—Site Index of Longleaf Pine on Poorly and Imperfectly Drained Soils in the Southeastern Coastal Plains as Influenced by Soil Characteristics[1]

Subsoil characteristics		Depth to mottling (Inches)		
Texture	Moisture equivalent (Percent, wt. basis)	18	30	48
		Site index		
Sand	3.2	59	62	67
Loamy sand	6.6	60	63	69
Sandy loam	12.7	62	66	71
Sandy clay loam	18.6	64	68	74
Sandy clay	25.0	67	70	76
Light clay	30.0	69	72	78
Heavy clay	35.0	71	74	81

[1]From Coile (*4*).

Table 3.—Site Index of Longleaf Pine in Texas, Louisiana, and Mississippi as Influenced by Rainfall and Soil Characteristics[1]

Depth to least permeable horizon (Inches)	Rainfall, January through June				
	24-26 Inches	26-28 Inches	28-30 Inches	30-32 Inches	32-34 Inches
	Site index				
0.5	74	74	74	75	75
6-10	74	74	75	76	77
11-15	73	74	76	77	78
16-20	73	75	76	78	80
21-25	73	75	77	80	82
26-30	72	75	78	81	84
31-35	72	75	79	82	85
36+	72	75	80	83	87

[1]From McClurkin (*8*).

[1]In this paper, the term "soil-site index" refers to an estimate of site index based on soil properties. "Site index" refers to the average height of the dominant stand, as actually measured, corrected to an arbitrary age of 50 years.

TABLE 4.—RELATION OF SOIL PROPERTIES TO THE SITE INDEX OF SLASH PINE[1]

Texture of subsoil	Site index (Round trees)
Sands and loamy sands	75
Sandy loam and sandy clay loam	80
Loam, clay loam, sandy clay, and light clay	85
Silty clay, heavy clay, silty clay loam, and silt loam	90

[1]From Coile(*4*).

of the subsoil and depth to mottling.

Working in east Texas, Louisiana, and Mississippi, McClurkin (*8*) found average rainfall during the first 6 months of the year and depth to the least permeable horizon to be good indicators of longleaf site index (Table 3).

The original study for slash pine was made by Knudsen who apparently worked throughout the natural slash pine range. His work was summarized by Coile (*3*) who showed imbibitional water value of the B horizon and turpentining as being significantly correlated with site index. Making use of a significant relationship between imbibitional water value and silt plus clay, Coile (*3, 4*) was able to develop Table 4, wherein it is only necessary to determine texture of the subsoil in order to find the soil-site index for slash pine.

The work for loblolly pine in the Coastal Plain of Alabama, South Carolina, Georgia, and Florida was done by Metz (*9*) and summarized by Coile (*3*). Metz found the imbibitional water value of the B horizon, silt content of the B horizon, clay content of the B horizon, depth of the A horizon, and surface drainage all significantly associated with site index, the clay content of the B horizon giving a negative relationship. From these

TABLE 5.—SITE INDEX OF LOBLOLLY PINE AS INFLUENCED BY DEPTH TO SUBSOIL, TEXTURE OF SUBSOIL, AND DRAINAGE IN THE COASTAL PLAINS OF SOUTH CAROLINA, GEORGIA, FLORIDA, AND ALABAMA[1]

Texture of subsoil	Surface drainage of land	Depth to subsoil (inches)						
		6	12	18	24	30	36	42
		Site index						
Sand and loamy sand	Good	80	85	85	85	85	90	90
	Imperfect	90	90	90	90	90	90	95
	Poor	90	90	90	90	95	95	95
Sandy loam and sandy clay loam	Good	85	85	90	90	90	95	95
	Imperfect	90	90	90	95	95	100	100
	Poor	90	90	95	95	100	100	100
Loam, clay loam, sandy clay and light clay	Good	85	90	90	95	100	105	105
	Imperfect	90	95	95	100	105	105	110
	Poor	90	95	100	100	105	110	115
Silty clay and heavy clay	Good	85	90	95	105	110	110	115
	Imperfect	90	95	100	105	110	115	120
	Poor	95	100	105	110	115	120	125
Silty clay loam and silt loam	Good	90	90	95	100	105	110	115
	Imperfect	90	95	100	105	110	115	120
	Poor	95	100	105	110	115	120	125

[1]From Coile (*4*).

TABLE 6.—DESCRIPTIONS OF PLOTS

Plot No.	Stand age (Years)	Topographic position	Surface drainage	Depth to mottling (Inches)	Topsoil		Subsoil texture[1]	Soil type	Site index[2] (Feet)	Soil-site index[3] (Feet)
					Texture[1]	Depth (Inches)				
				Longleaf pine						
1	32	Upper slope	Good	....	s.l.	10	s.c.	Ruston	69	72-76
2	27	Lower slope	Imperfect	28	v.f.s.l.	20	s.c.	Bowie	80	70-79
3	40	Ridge-upper slope	Good	....	s.l.	10	s.c.-c.	Red Bay	65	74-76
4	32	Upper slope Head of draw	Good	34	f.s.l.	14	s.c.-c.	Bowie	76	72-77
5	34	Branch bottom	Poor	17	f.s.l.	45	h.c.	Myatt	77	71-83
6	42	Upper slope	Good	....	l.s.	23	l.s.	Lakeland	61	65-80
7	54	Second bottom	Imperfect	18	c.l.	18	h.c.	Wahee	79	72-80
8	31	Flat upland	Poor	....	v.f.s.l.	9	s.c.-c.	Red Bay	80	76-77
9	41	Rolling	Good	....	f.s.l.	9	s.c.-c.	Ruston	71	74-76
10	29	Flat upland	Poor	27	v.f.s.l.	8	c.	Bowie	84	72-76
11	47	Upper slope	Good	....	s.-l.s.	46	s.l.	Guin	72	66-83
12	32	Upper slope	Good	....	l.s.	15	s.l.-s.c.l.	Guin	68	67-77
				Slash pine						
1	23	Branch bottom	Poor	17	f.s.l.	45	h.c.	Myatt	88	90
2	67	First bottom	Poor	2	silty c.	6[4]	silty c.l.[4]	....	86	90
3	35	Pond edge	Poor	30	f.s.l.	28	s.c.-c.	Leaf	93	88
4	42	First bottom	Poor	32	s.l.	60	h.c.	Myatt	90	90
5	31	Second bottom	Poor	18	l.s.-s.l.	48	s.c.	Myatt	90	85
6	36	Pond	Poor	16	c.l.	10	c.	....	97	90
				Loblolly pine						
1	64	Second bottom	Imperfect	27	f.s.l.	36	c.	Ochlockonee	97	105
2	28	Mid-slope	Good	22	v.f.s.l.	26	s.c.-c.	Shubuta	100	97
3	36	Ridge	Good	....	s.l.	10	bedrock	Lauderdale	75	80
4	48	Second bottom	Poor	18	c.l.	18	h.c.	Wahee	90	105
5	29	First bottom	Poor	8	silt l.	13	silty c.	Chastain	118	101
6	23	Ridge-upper slope	Good	13	f.s.l.	3	c.	Lauderdale	81	82

[1]Abbreviations for texture: c.—clay, h.c.—heavy clay, f.—fine, v.f.—very fine, l.—loam or loamy, s.—sand or sandy.
[2]Total height of dominant trees at age 50 (*12*).
[3]From Tables 1 through 5. Under *Longleaf pine*, the first soil-site index is from Table 1 or 2, depending on drainage, and the second is from Table 3.
[4]No subsoil, in the sense of a relatively fine-textured horizon, was encountered in this alluvium. The profile was not sampled below 20 inches because of soil water conditions.

relationships, Coile (*3, 4*) developed Table 5, wherein by measuring the depth to the subsoil, estimating the texture of the subsoil, and determining the surface drainage one can obtain soil-site index for a loblolly pine site. It is not clear how the imbibitional water value of the B horizon is incorporated into this table.

Other soil-site index regression studies in the southeast include Coile's (*2*) for loblolly and shortleaf pines on the Piedmont, Goggans' (*7*) for planted loblolly and slash pines on the Alabama Piedmont, Barnes and Ralston's (*1*) for planted slash pine in Florida, and Zahner's (*13*) for loblolly pine on the Gulf Coastal Plain of Mississippi, Louisiana, and Texas.

Procedure

Soil-site indices were tested against site indices on a series of plots within well stocked, even-aged stands. Descriptions of the plots, as well as site indices and soil-site indices, are given in Table 6. Each plot was a half-acre or more in area, and was uniform with respect to soil, topography, and vegetation. Locations of the plots are given in Figure 1. Eighteen plots were on Lower Coastal Plain soils, and six were in the Upper Coastal Plain. Of the latter, five were in the loblolly pine type, and one was in the longleaf type.

Site indices were measured according to the instructions given in U.S.D.A. Miscellaneous Publication 50 (*12*). The soil profile data for each plot, used in determining soil-site index, are averages from four sample borings taken to a depth of at least 60 inches. Average rainfall for the first 6 months of the year, necessary for use with McClurkin's table for longleaf pine, was 31 inches for all longleaf plots (*11*).

Results and Discussion

Longleaf pine.—Figures 2 and 3 show longleaf soil-site index values plotted against corresponding site index values. Figure 2 employs Coile's Tables 1 and 2, and Figure 3 employs McClurkin's Table 3. Perfect agreement between soil-site indices and site indices is represented by the 45-degree straight line in each figure; thus the distance of each plotted point from the line is indicative of the amount of disagreement between these two values for the plot involved.

Figure 2 clearly shows that imperfectly to poorly drained sites are superior in site index to well drained sites. At the same time, it demonstrates the failure of soil-site index Table 2 to support this superiority. Ralston's results (*10*), from which Tables 1 and 2 were derived, do however strongly support the superior productivity of the more poorly drained sites. A correction of plus 7 feet to all soil site-index values in Table 2 will bring them approximately in line with corresponding site index values.

Figure 3 demonstrates the inadequacy of McClurkin's Table 3 for estimating reasonable soil-site indices in southwestern Alabama. Undoubtedly the most important site factor for this area not included in Table 3 is the drainage factor.

The data in Table 6 and in Figures 2 and 3 are strongly indicative of three basic longleaf site quality classes. These are: (1) poor—well drained deep sands, (2) fair—well drained soils with some clay in the subsoil, and (3) good—imperfectly to poorly drained soils.[2] On the basis of the data and field observations, the following classification is proposed for field use:

1. Poor (site index under 65 (feet). Well drained gravelly

[2]This class should not be extended to include poorly drained soils on which longleaf stands do not naturally occur.

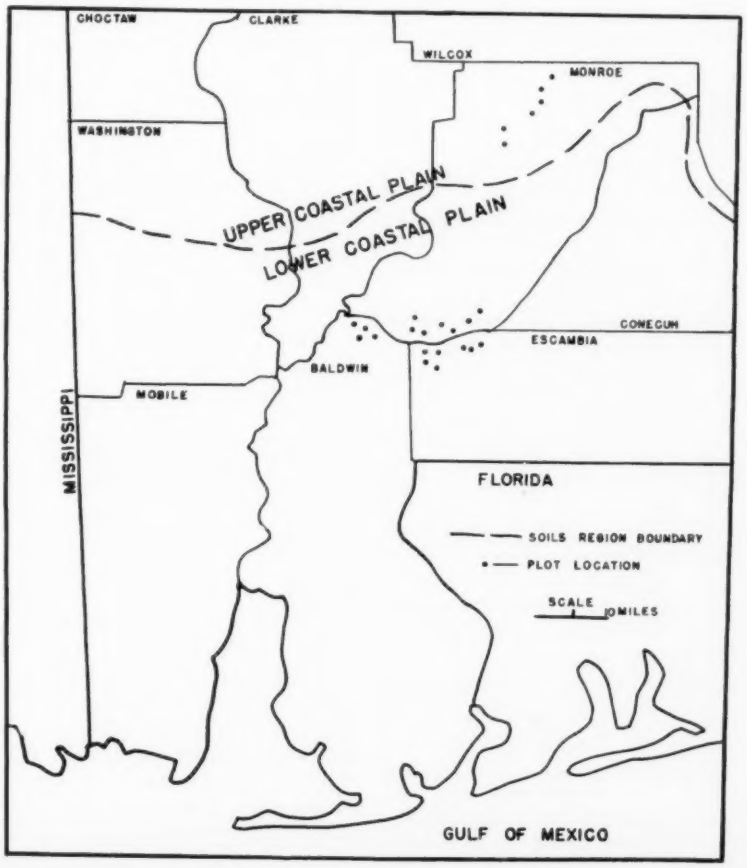

Fig. 1.—The location of plots for the testing of soil-site index tables in southwestern Alabama.

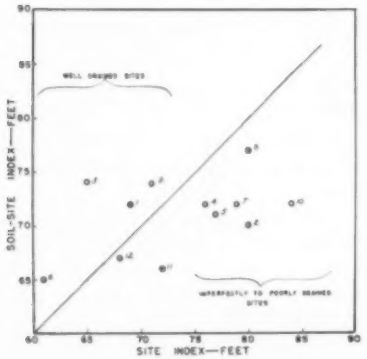

FIG. 2.—Longleaf pine soil-site indices, using Tables 1 and 2, plotted against site indices. The straight line represents the theoretical perfect agreement between the two sets of values. The numbers are plot numbers from Table 6.

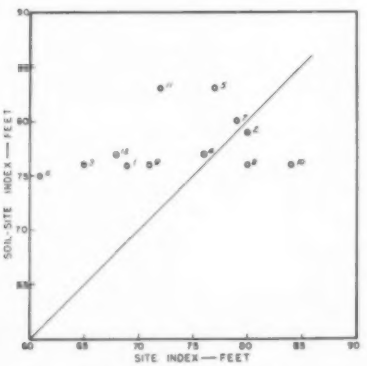

FIG. 3.—Longleaf pine soil-site indices, using Table 3, plotted against site indices. The straight line represents the theoretical perfect agreement between the two sets of values. The numbers are plot numbers from Table 6.

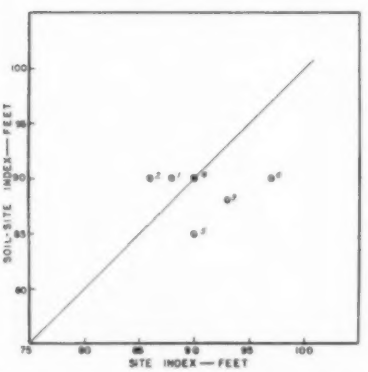

FIG. 4.—Slash pine soil-site indices, using Table 4, plotted against site indices. The straight line represents the theoretical perfect agreement between the two sets of values. The numbers are plot numbers from Table 6.

sands, and coarse loamy sands more than 6 feet deep. Includes also other well drained soils from which the topsoils have completely or almost completely eroded.

2. Fair (site index 65 to 74 feet). Well drained soils having subsoils with a noticeable clay content (sandy loam or heavier in texture) at less than 6 feet from the surface. These soils are always located on hilly, rolling, or distinctly undulating topography. The worst of these sites are on ridge tops and upper slopes with convex surface configurations. The best are on mid-slopes with flat to concave surface configurations. There should be no distinct mottling in the soil profile.

3. Good (site index 75 to 85 feet, and perhaps higher). Imperfectly to poorly drained soils with heavy subsoils. These sites are located on flat uplands, in natural coves within hilly country, on lower slopes just above ponds and stream bottoms, and in branch and river bottoms. Except on flat uplands, distinct mottling should be present in the soil profile. The worst of these sites are in the better drained coves and in the most poorly drained bottoms. The best are on lower slopes just above ponds and bottoms and on flat uplands with very fine sandy loam topsoils and clay subsoils.

This classification will give more accurate approximations of longleaf site index within the study area than will the published soil-site index tables. It is of course subject to revision and improvement as the result of more thorough investigation. Its applicability to other similar localities is unknown, but if used in other areas, corrections for differences in rainfall should probably be made (*8*).

Slash pine.—Figure 4 shows a reasonable agreement of slash pine soil-site indices with site indices, but fails to show any definite trend relationships between the two. This may well be, of course, the result of the small number of plots, but it is felt that this situation would also be true for a relatively large number of plots. The total range in soil-site index in Table 4 is only 15 feet, while the range in soil-site index for the study area would appear to be only 5 feet since the subsoil is invariably sandy clay or finer in texture. The standard error of estimate for Table 4 is unknown, but is apt to be around 10 percent of the mean site index, as it is for other correlations of this type. This means an error range of ± 8 to 9 feet, or a total error range of 16 to 18 feet which exceeds the total range of soil-site indices in the table. For the study area, therefore, with its soil-site index range of only 5 feet, it would seem to be just as accurate to apply a mean soil-site index as to actually measure soil-site indices using Table 4. The mean soil-site index suggested for this area is 90 feet.

The population sampled for Table 4 of necessity includes only a narrow range of drainage conditions in southwestern Alabama, because well stocked natural stands of slash pine, suitable for measuring height growth of dominants, occur only under such a range. This fact must be kept in mind when this table is applied to areas not stocked or lightly stocked with slash pine at the present time. It seems likely that the table might apply to all conditions previously described for imperfectly to poorly drained longleaf sites, and to additional conditions of even poorer drainage. However, soils that have a muck or peat topsoil, or that show strong mottling in the surface 2 or 3 inches, are too wet, are outside the sample population, and generally will produce poorer slash pine growth than indicated by Table 4.

Loblolly pine.—Soil-site indices in Table 5 range from 80 to 125 feet, a total distance of 45 feet. Site indices of the six loblolly plots range over a distance of 43 feet (Table 6 and Fig. 5). A standard error of estimate of 10 percent (*3*) for Table 5 will give a total error range of around 20 feet. Thus it is apparent that the error range for this soil-site index table is much lower than its total range of soil-site indices, and much lower than the total range of site in-

dices to be found in the study area. These facts give value to the loblolly table over and above that of the slash table. It can readily be seen that the loblolly table, in view of the relatively low ratios of expected errors to the site index ranges to be found in small geographical areas, can function more effectively in lessening errors in estimating site indices from soil properties.

Figure 5 shows approximate agreement between soil-site indices and site indices for the well drained plots, but it reveals considerable disagreement for the plots with imperfect and poor surface drainage (Plots 1, 4, and 5). The small number of plots prohibits definite conclusions in this respect, but Metz' basic work (*9*), from which Table 5 was derived, does leave a possibility for relatively large errors in soil-site index determinations for sites of imperfect to poor surface drainage. It should be emphasized that "surface drainage" is only roughly related to internal drainage, and that the latter can vary considerably within a surface drainage class. It is well known, for instance, that a foot or so of change in elevation in a bottom land soil of poor surface drainage can profoundly change site quality through changing internal drainage. Ralston (*10*) found internal drainage, as judged by measuring depth to mottling, to have an important influence on the height growth of longleaf pine on sites having imperfect and poor surface drainage. Nevertheless, Metz (*9*) did not test his data from plots of imperfect to poor surface drainage for this type of relationship.

The soil type represented by Plot 5 is known to be of common occurrence throughout the extensive Flat Creek drainage of Monroe County. It commonly supports loblolly pine stands with site indices of around 120 feet, as well as magnificent hardwood stands. Whatever the properties responsible for the superiority of this soil, they are inadequately reflected in Table 5.

Plot 4 was located in Baldwin County well south of Metz' sampling area. The loblolly pine type continues farther south for many miles and over an extensive area in the Alabama River bottom and on adjoining hills.

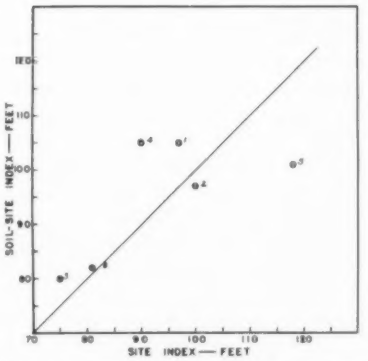

Fig. 5.—Loblolly pine soil-site indices, using Table 5, plotted against site indices. The straight line represents the theoretical perfect agreement between the two sets of values. The numbers are plot numbers from Table 6.

Summary and Conclusions

Tables 1 and 2 might be used effectively for predicting longleaf soil-site indices in the study area if certain corrections are made. However, pending more detailed studies of longleaf site quality in Alabama, it is felt that a suggested site classification, based upon topographic situation and the presence or absence of a noticeable clay in the subsoil, would be superior. Table 3 has little application for longleaf pine in southwestern Alabama because it fails to take any account of the important drainage factor.

Table 4 seems to measure slash pine soil-site indices within a reasonable error range. However, the range of soil-site indices to be found is so narrow that there is little likelihood of a regression relationship being demonstrated with even 20 or 30 plots. Rather than use the table for individual determinations, it would seem to be equally effective to apply an average soil-site index of 90 feet to all cases. Since the site indices vary more than the soil-site indices, it may be that there are measurable soil factors unaccounted for in the basic study for Table 4.

Indications are that loblolly pine Table 5 can be of considerable use, particularly for well drained sites. Errors for sites of imperfect to poor surface drainage may be large because one or more significant factors may not have been accounted for in the basic regressions. Internal drainage is a factor of possible significance in this respect.

Without specific evidence to the contrary, it must be assumed that all five soil-site index tables apply only to habitats that are known to support extensive natural stands of the respective species. Data for the basic regression studies could have been obtained only from such areas. This fact limits the application of slash pine Table 4 much more than it limits the other tables.

Caution and testing should be used in applying the tables outside the sampling areas from which they were derived. A sampling area map should be obtained to accompany each table.

The field worker should be aware of the factors that were tested, either directly or indirectly, in the construction of the soil-site index table that seems most appropriate to his use. If his local experience indicates the existence of important factors that were not tested, he then has cause to be wary of inaccurate predictions.

At best, errors of estimate and errors of judgment are such in the use of these soil-site index tables as to make site index preferable wherever it can be satisfactorily measured. Where site index cannot be satisfactorily measured on a specific problem area, it often can be measured on nearby areas of the same site. If this cannot be done, then the soil-site index, derived with the help of an appropriate table, is the best available estimate of site index. To substitute soil-site index for site index in all cases, however, as has been suggested (*5*), will often amount to substituting a qualitative estimate for a quantitative measurement of site productivity.

The great weakness of site index measurement lies in the height-age curves (*12*) that must be used in correcting average heights of dominants to age 50. These curves were

constructed from data obtained from all or most of the environmental provinces and geographic races of southern pine species found in the entire Southern Pine Region. The curves, therefore, may be inaccurate for any one locality, but the writer does not believe that the magnitude and direction of the inaccuracy will necessarily be the same in going from one area of comparatively uniform climate, soils, and heredity to another that is different in these respects. Until site index curves are corrected for use in comparatively small areas, as was done for loblolly and shortleaf pines in the North Carolina Piedmont (*6*), it will be wise not to place too much confidence in site indices derived from stands under 25 to 30 years of age.

In general, the soil-site index tables of highest utility are designed for relatively small geographic areas with uniform climates and distinctive soil conditions. Such tables can be of considerable value on many areas where it is not possible to obtain reliable site indices. Of far greater value than the tables themselves, however, are the basic studies from which the tables were derived. These have taught much concerning the influence of various site factors on the southern pines, giving field workers better perspectives for their constant observations of ecological relationships.

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Notes

Growth of Planted Slash Pine on Cutover Lands and Old Fields

R. M. Allen's note in the August 1955 issue of the JOURNAL OF FORESTRY[1] comparing the growth of longleaf pine (*Pinus palustris* Mill.) on old fields and cutover lands prompts this note relative to the growth of slash pine (*Pinus elliottii*) on the two sites. Allen found the growth of longleaf on old-field sites in south Mississippi markedly superior to that on cutover lands. The same has been found true of slash pine on the George Walton Experimental Forest in the Middle Coastal Plain of Georgia. Numerous plantings which offer direct comparisons between the two sites reflect the superiority of the old-field areas in every case. Height growth differences between the two sites are outlined in Table 1.

Growth on the wild area is less than half that on the field site. In fact, on Area 2 it is only 30 percent of the total for the old-field site. There also appears to be a relationship between growth and length of time since cultivation—the more recent the cultivation, the better the growth. Counts on two areas indicate that survival is also better on field sites. Average survival for field plantings is 75 percent, whereas wildlands average only 50 to 60 percent, especially if the rough is heavy. The spacing is 5x10 feet in all plantings, except in the field site in Area 1, where it is 6x6.

TABLE 1.—A COMPARISON OF SLASH PINE GROWTH ON OLD FIELD AND CUTOVER AREAS

Site (and years idle)	Time since planting	Mean height
	Years	*Feet*
Area 1		
Field (2 yrs.)	5	11.6
Cutover area	3	2.6
Area 2		
Field (2 yrs.)	5	11.6
Cutover area	5	3.5
Area 3		
Field (5 yrs.)	5	10.5
Cutover area	5	4.5
Area 4		
Field (10 yrs.)	5	9.5
Cutover area	5	4.5

As in Allen's test, no comparison of soil properties between the two sites has been made other than percolation rate. One test of percolation indicated the cutover areas have a slightly faster rate. This agrees with findings of Lutz and Chandler[2] who state that "The infiltration capacity of a forest soil is usually decreased as a result of cultivation. . ." The percolation rate of both is so rapid, however, that any difference between the two is of minor importance. Soils of the old-field areas are all similar and probably belong to either the Gilead or Lakeland series, which make up approximately 85 percent of the old-field areas in the vicinity. The cutover areas are of the same series but with a slightly lower elevation, which gives them an advantage from the standpoint of available moisture.

[1]Allen, R. M. Growth of planted longleaf pine on cutover land and old fields. Jour. Forestry 53:587. 1955.

[2]Lutz, Harold J., and Robert F. Chandler, Jr. Forest soils. John Wiley and Sons, Inc. New York. 514 pp. 1946.

FIG. 1.—Three-year-old planted slash pine on cutover area (*left*) and old-field area (*right*). One crew planted both areas, using seedlings from the same shipment.

The vegetative cover for the two sites is about the same as that listed by Allen for south Mississippi. On abandoned fields, broomsedge (*Andropogon virginicus* L.) takes over from coarse weeds after a few years, while on the cutover areas slender bluestem (*A. tener* [Nees] Kunth) and wiregrass (*A. stricta* Michx.) are the major grasses. Some gallberry (*Ilex glabra* L. Gray) and associated shrubs are present on the lower cutover sites.

As Allen suggested, the reasons for the growth differential between the two sites are purely conjectural. He surmised that tillage possibly changed the soil structure somewhat, and that there might be a residual fertilizer effect. Competition would also appear to be less in the old-field sites, since the vegetative cover is usually less dense.

It appears that growth differences are the result of a combination of factors, all highlighting the need for site preparation on cutover areas. Not only can survival and growth be increased, but the cost of planting can be reduced. In one test, local labor using the planting bar planted about twice as many seedlings per man-day in old-field areas as they did on cutover areas. This is one more illustration of the hypothesis that increased survival, better growth, and reduced planting cost will more than offset the expense of site preparation on average cutover areas.

Despite the increased initial height growth resulting from site preparation or plantation cultivation, these practices may be inadvisable where southern fusiform rust is an appreciable problem in slash pine plantations. As Balthis and Anderson[3] and Boggess and Stahelin[4] have pointed out, these and other growth-stimulating practices may double the rate of rust infection on the trunks of this species.

FRANK A. BENNETT
Southeastern Forest Experiment Station
Asheville, N. C.

[3]Balthis, R. F., and D. A. Anderson. Effect of cultivation in a young slash pine plantation on the development of Cronartium cankers and forked trees. Jour. Forestry 42:926-927. 1944.

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Tamarack Mortality in Minnesota Due to Larch Sawfly Outbreak

The larch sawfly (*Pristiphora erichsonii* [Htg.]) has been in epidemic status on tamarack (*Larix laricina* [Du Roi] K. Koch) throughout northern Minnesota since 1948. Tamarack mortality resulting from sawfly defoliation was first observed by H. L. Sundling in timber sales on the Two Harbors and Aurora Ranger Districts of the Superior National Forest in the fall of 1954, seven years after the outbreak began. This agrees with similar observations in Canada, where dead trees were found after seven years of defoliation.[1] Further evidence on tamarack mortality was obtained in 1955 in a study conducted by the writers.

Permanent study points were established in 1951 and 1952 within 26 stands throughout the infested area to observe sawfly population levels, defoliation, and tamarack decadence. Defoliation estimates were made in each study area from 10 well-spaced trees, and the tree decadence observations were made on 1/10-acre plots within the stand.

Dead tamarack trees were discovered on the plots in 1955. The criterion for mortality was brown inner bark completely ringing the tree. Individual tree examination revealed that the eastern larch beetle (*Dendroctonus simplex* Lec.) was not a cause. Furthermore, the species associated with tamarack, such as black spruce (*Picea mariana* [Mill.] B.S.P.) and northern white-cedar (*Thuja occidentalis* L.) had not been killed; this ruled out the possibility of death caused by adverse growing conditions such as

TABLE 1.—DEFOLIATION AND TAMARACK MORTALITY CAUSED BY THE LARCH SAWFLY, NORTHEASTERN MINNESOTA, 1952-55

Plot location	Average percent defoliation				Total number of trees[1]	Number of dead trees[1]	Percent mortality
	1952	1953	1954	1955		1955	
Florenton	100	95	75	100	58	17	29
Aurora	95	95	65	80	10	1	10
Embarrass	95	100	95	95	31	9	29
Ely	70	90	60	60	25	0	0
Wales	100	75	60	80	38	0	0
Mt. Weber lookout	85	95	55	65	13	1	8
Slate Lake	100	95	65	75	17	1	6
Finland	100	100	80	80	9	2	22
Ely-Isabella-Finland junction	90	95	85	95	37	2	5
Sawbill trail	40	75	70	80	41	0	0
Gunflint blister rust camp	...	...	80	100	7	1	14
Gunflint trail	25	65	70	80	12	0	0

[1]Includes all tamarack 4 inches or more in d.b.h. on 1/10-acre plot.

[1]Turnock, W. J. Tamarack killed by the larch sawfly. Canada Dept. Agric. Sci. Serv., Forest Biology Division, Bi-Monthly Progress Report 10(1):2. 1954.

flooding or unusual weather.

The data obtained at the study points, as well as other observations throughout the area of infestation in Minnesota, indicate that mortality at present is confined to widely scattered pockets of tamarack in the northeastern part of the state. This area lies east of U. S. Route 53 and north of a line running west from Two Harbors. So far as known, no trees have been killed during the present outbreak in the vast north-central tamarack bogs.

Tamarack was killed in 8 of the 12 plots in this northeastern area (Table 1). At Florenton, where 29 percent of the trees were dead, the mortality occurred only along the exposed western edge of the stand; tamarack growing three chains or more into the stand was still alive. This site is well drained. The other plots where mortality occurred generally had thin duff layers over mineral soil and rock outcrops.

L. C. BECKWITH and
A. T. DROOZ
Entomologists, Lake States Forest Experimental Station,[2] St. Paul, Minnesota

[2]The Station is maintained by the U. S. Department of Agriculture, in cooperation with the University of Minnesota, St. Paul 1, Minnesota.

Seed Trees Retard Longleaf Pine Seedlings

A study in South Alabama indicates that longleaf pine seed trees reduce the survival and vigor of seedlings for distances of at least 50 feet—well beyond the reach of the tree crowns.

The study is being conducted on the Escambia Experimental Forest and the Conecuh National Forest. Some of the plots are on poor sites characterized by deep coarse sands and some on good sites having a sandy loam or heavier subsoil within 2 feet of the surface.

The plots were laid out in transects radiating from seed trees in large openings. Each transect is 52.8 feet long and consists of 8 linearly contiguous square milacre plots, beginning 3.3 feet from the seed tree. In all, there are 30 transects, near 30 seed trees. The seed trees range from 6 to 14 inches in d.b.h.

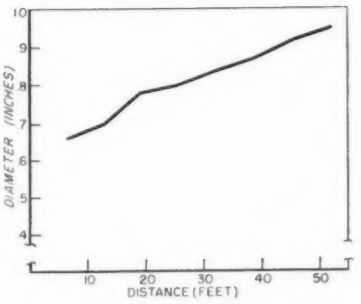

FIG. 1.—Root-collar diameters of 5-year-old longleaf seedlings at increasing distances from seed trees.

The study, which is still continuing, was established in January 1949 with 1-year-old seedlings from the 1947 seed crop. Hardwood competition and pine seedlings more than 1 year old, were removed. In 1951 each milacre was thinned to a maximum of 10 seedlings and all plots were prescribe-burned to check the brown spot needle blight.

Results

Fifth-year survival of the seedlings was slightly lower near the base of the seed trees. About 77 percent of those within 16 feet of the seed trees were alive, as against 87 percent of those farther away. The prescribed burn was partly responsible for the reduced survival near the seed trees. The seedlings there were smaller and more susceptible to injury, and the dried pine needles that had accumulated under the crowns increased the intensity of the fire.

Root-collar diameters of the 5-year-old seedlings averaged 0.66 inch near the base of seed trees and increased to 0.95 at a distance of 53 feet. Probably the retardation goes out beyond this point, for the curve in Figure 1 shows no sign of leveling off. On the poor sites the effects of competition are more severe than on the good sites.

Since the maximum crown radius is 20 feet, these data would seem to indicate that some other factor—such as root competition— limits longleaf seedling growth more than shading does.

L. C. WALKER[1] and V. B. DAVIS
Respectively, School of Forestry, University of Georgia, Athens, and Southern Forest Experiment Station, Forest Service, U. S. Department of Agriculture

[1]This study was conducted while with the Southern Forest Experiment Station, Forest Service, New Orleans.

The Extraction, Storage, and Germination of Eastern Hemlock Pollen

In genetic studies of tree variation and in the development of new superior strains, controlled pollination often is required, and frequently it is desirable to obtain pollen from regions where it ripens at a time different from that of the region where the pollination is done. Forcing, storage, and viability testing of pollen, therefore, are an intimate part of all tree breeding work.

Extraction of pollen is not difficult provided the branches are taken in immediately before natural pollen shedding occurs. However, if pollen from a locality with a late season is to be used on trees in a locality with an early season, extraction becomes a real problem: earlier collection means a longer forcing period, which allows more chances for the flowers to dry out before pollen is shed. Any practical means for overcoming these difficulties will, therefore, be very useful to tree breeders.

Tests have proved that eastern hemlock seedlings respond distinctly to long-day treatments; at a daylength of 20 hours the length of the growth period and, therefore, total elongation of the leader are more than doubled in comparison with those of seedlings exposed to a 12-hour day. A study, therefore, was made of the effect of long-day treatments on cut branches brought indoors for pollen extraction. In addition, the effects of the relative humidity and temperature on the storage and subsequent germination of hemlock pollen were observed.

TABLE 1.—THE EFFECT OF LONG-DAY TREATMENTS AND TIME OF COLLECTION ON THE FORCING OF MALE FLOWERS OF EASTERN HEMLOCK

Date of collection	Daylength treatments			
	20 hours' light		Natural daylength	
	Date of pollen production	Forcing period	Date of pollen production	Forcing period
		Days		*Days*
2/2	3/1	27	[1]	[1]
2/12	[1]	[1]	3/10	28
2/16	3/8	20	[1]	[1]
2/23	[2]	[2]	[2]	[2]
3/4	3/21	17	[2]	[2]
3/11	3/26	15	4/3	23
3/18	3/29	11	4/6	19
4/9	4/17	8	4/19	10
4/20	[2]	[2]	[2]	[2]
4/27	5/1	4	5/1	4

[1]No branches exposed to this treatment.
[2]Flowers dried out before pollen was produced.

Experimental Procedures and Results

Pollen extraction.—Eastern hemlock pollen sheds naturally between the 5th and 10th of May in the vicinity of New Haven, Connecticut. For the forcing tests, branches were collected during the winter and spring of 1954, beginning February 2. The branches were placed in plastic cages in a sand medium or in beakers with distilled water. The bases of the branches were cut at intervals during the forcing in order to maintain a free water uptake. The branches were exposed to 2 light treatments—normal and 20 hours' daylength. For the 20-hour treatment, the branches were exposed to the diffused daylight in the laboratory supplemented by a 25-watt incandescent bulb with a time-switch control. Natural daylength treatments were in the greenhouse. Although the temperature and humidity in the laboratory were not identical to those in the greenhouse, they were sufficiently similar to permit comparative observations.

The length of time required for forcing was affected by the treatments and the time of collection of the branches (Table 1). Thus a longday treatment of 20 hours of continuous light shortened the length of time required for forcing for the early collections by as much as 8 days. As the season progressed, however, differences between the two treatments gradually disappeared. Branches taken into the laboratory after April 27 produced pollen in 3 to 5 days regardless of treatment. Additional observations showed that on branches collected early in the season, only the flowers fully exposed to the light produced pollen; shaded flowers showed signs of etiolation, and no pollen was produced.

Pollen storage and germination.—Experiments showed that Righter's[1] germination technique, using a 10-percent sucrose solution as the medium, was very satisfactory for hemlock pollen. This method was used to test the viability of stored pollen.

On May 7, 1954, pollen from a single hemlock tree was stored at temperatures of 1° C., 7° C., 16° C., and room temperature (approximately 20° C.), and at relative humidities of 10 and 50 percent for each temperature. Sulphuric acid was used as a desiccant. An additional sample was stored over calcium chloride at room temperature. On April 16, 1955, the samples were subjected to a final test for viability. The tests were made at 25° C. and at room temperature.

Evidently hemlock pollen can be stored at a wide range of temperatures, 16° C. giving practically as good results as 1° C. (Table 2). Relative humidity, however, is an important factor, 10 percent being decidedly poorer than 50 percent. Pollen stored over calcium chloride (no humidity) failed to germinate after 1 year of storage and showed a marked decrease in viability—only 7 percent germinated—after 1 month of storage. This indicates that hemlock pollen should be shipped without desiccation.

TABLE 2.—THE EFFECT OF TEMPERATURE AND HUMIDITY ON THE VIABILITY OF EASTERN HEMLOCK POLLEN STORED 1 YEAR[1]

Storage conditions		Pollen viability at—	
Temperature	Relative humidity	25° C.	Room temperature
	Percent	*Percent*	*Percent*
1° C.	50	88	90
	10	31	32
7° C.	50	92	90
	10	64	64
16° C.	50	86	84
	10	70	72
Room	50[2]	39	49
	10[2]	28	30
	0[3]	0	0

[1]The authors wish to thank R. M. Echols, of Yale School of Forestry, who tested the viability of the pollen.
[2]These samples were subjected to desiccation only during the first 6 months of storage.
[3]Over $CaCl_2$.

FRANK S. SANTAMOUR, JR., and HANS NIENSTAEDT[2]
Respectively, Harvard University, and Lake States Forest Experiment Station[3]

[1]Righter, F. I. A simple method of making germination tests of pine pollen. Jour. Forestry 37: 574-576. 1939.
[2]Dr. Nienstaedt was on the staff of The Connecticut Agricultural Experiment Station, New Haven, Conn., at the time this study was made. The study was part of that Station's hemlock breeding program.
[3]Maintained in cooperation with the University of Minnesota by the Forest Service, U. S. Dept. Agric.

Summer Shoots Cause Permanent Damage to Red Pine

During the summer when growing conditions are suitable conifers and certain hardwoods occasionally produce a second increase in growth before dormancy. These "summer shoots" or "lammas growth" are formed by elongation of buds which were set earlier in the summer. Shoots of some length may be produced before new terminal and lateral buds are formed. This phenomenon has been noted in white pine, red pine, Douglas-fir, maples, and oaks. Although many foresters have observed the development of summer shoots, few realize that their occurrence may have a permanent effect on the condition and form of the tree.

During a late rainy period in the dry summer of 1953 many summer shoots were observed in a 6-year-old red pine (*Pinus resinosa* Ait.) plantation located on the White Sulphur Springs District of the Monongahela National Forest in southeastern West Virginia. Red pine reaches the southern extremity of its range in the mountains of West Virginia; however, these plantations are located approximately 50 miles south of the natural range of this species.

Examination of these stands showed that 19 percent of the trees had one or more summer shoots. This growth was almost entirely restricted to the largest and most vigorous pines. Closer examination showed that these shoots had originated exclusively from lateral buds surrounding the terminal bud of the leader. These new lateral summer shoots extended 1 to 5 inches above the dormant terminal bud and each shoot had set 1 to 3 new winter buds at the tip.

Fig. 1.—Forked top of red pine. The leaders on the right and left of the main axis originated as summer shoots.

There was no evidence that lammas growth had occurred previous to the summer of 1953. No summer shoots were formed in 1954 and 1955. It seems probable that the severe drought during June and July, 1953, had shortened the normal growth period. An increase in precipitation in late July had again produced favorable growth conditions and the dormancy of the lateral buds had been broken forming summer shoots.

An examination of these plantations during the spring of 1955 showed that 76 percent of the trees which had produced lammas growth now had two or more strong leaders which would produce a permanent fork in the bole, thus making the tree undesirable for future saw log production (Fig. 1). The terminal axis had maintained dominance on the remaining trees which had formed summer shoots, but the lammas growth had formed large, ascending branches which would live for many years and eventually act as avenues for decay to enter the bole.

Unless branches and double tops originating from lammas growth are removed, repeated formation of summer shoots, caused by early summer droughts followed by late summer rains, could eventually deform a sufficient number of stems to eliminate all possibility of future saw timber production from these plantations.

Kenneth L. Carvell
Assistant professor of silviculture,
Division of Forestry,
West Virginia University,
Morgantown

Coming Events

Canadian Forestry Association

The Canadian Forestry Association will hold a National Forestry Conference in Winnipeg, Ontario, Canada, September 17-19, 1956.

Gulf States Section Meeting

The Gulf States Section will hold its annual meeting at the Hotel Beaumont, Beaumont, Texas, on May 10-11, 1956.

Southern Forest Fire and Woods Arson Conference

Sponsored by national and southern forestry and industrial groups, the Southern Forest Fire and Woods Arson Conference will be held April 12-14 in the Roosevelt Hotel, New Orleans, La.

Upper Mississippi Valley Section

The spring meeting will be held at Grand Rapids, Minn., April 5-6. Subject: "Bringing up-to-date the S.A.F. Forestry Program for Minnesota." The summer meeting is scheduled for August 17-18 at Bottineau, N. Dak.

We Present

Carlos Glazier Bates: Pioneer Silviculturist 1885—1949

In February 1953, the Central Rocky Mountain Section of the Society of American Foresters voted to commemorate the career and the pioneer contributions of Carlos G. Bates to scientific forestry research by dedicating the plantations at the old Fremont Experiment Station, which he founded, to his memory. The station was closed and its program of studies discontinued in 1935. By official action of the Forest Service the recommendation was approved. The plantations will be permanently marked as the Carlos G. Bates Memorial Plantations.

Bates was born October 14, 1885, in Topeka, Kansas, the son of an Episcopalian missionary. Little is known of his early life; he was not given to talking about himself. Although not a recluse, he was naturally inclined to be taciturn, independent, introspective, and an introvert by nature—in short, somewhat of a "lone-wolf." His early life was spent in the Great Plains region, mostly in Nebraska, where his father served as a clergyman. From his father, whose avocation was botany (many of the plant specimens in the old Fremont herbarium were collected and identified by him) he inherited his predilection for the botanical sciences. He was always partial to the prairie region.

Bates was graduated from the University of Nebraska with a B.S. degree in 1907.

Following his graduation, he received appointment as a forest assistant in the Forest Service, effective July 1, 1907, at a salary of $1,000 per annum. His record reveals a recommendation to the Secretary of Agriculture by Gifford Pinchot on January 1, 1910, urging a promotion to $1,400 per annum. In those days, such a promotion was noteworthy. Unquestionably, it reflected an early recognition of his worth in the field of silvicultural research to which he had dedicated himself.

One of the first projects assigned Bates was to plant trees on the prairies around homesteads and cultivated fields to protect them from the hot, drying winds. It is possible that he engaged in some of the work prior to his appointment while still a student at Nebraska. It was during this period that the Forest Service was pioneering its venture in sandhills planting at Halsey, Nebraska, and this experiment profoundly impressed Bates. In years to come, it would be his good fortune to direct the experimental work connected with, and to recommend many of the applied practices, in this vast afforestation project.

During the early years of his Forest Service career, he was one of a group of young foresters who suggested to Chief Forester Pinchot the need for forest experiment stations. Bates was assigned the project of establishing a station within the Central Rocky Mountain District, or Region as it is now known. On September 3, 1909, this project came to fruition with the establishment of the Fremont Experiment Station near Manitou Springs,

CARLOS GLAZIER BATES
1885—1949

Colorado, in a pleasant mountain valley on the east slope of Pikes Peak.

It is difficult, in this day and age, to envision the vicissitudes which attended the founding, developing, and carrying on of the activities of a pioneer station, which Fremont was in every sense of the word. In 1918, the station acquired a wagon which constituted the sole vehicle available to the Station during its entire period of operation. It was used to haul out the last load from the station when it was closed in October 1935.

The first few years were devoted to constructing the physical plant, including laboratory, greenhouse, experimental seed extracting kiln, and to surveying and blocking out the station area. The first management project, in Douglas-fir, was initiated in November 1913. An arboretum was started. An extensive program of exotic tree introduction was initiated. Much time was given to seed collecting and testing, this work tying in with a comprehensive program of study to determine the amount and periodicity of seed production by Rocky Mountain conifers in relation to climatic conditions, flowering, and cone production. Several plantations were established to determine the practical significance of geographic varieties, which field of inquiry was subsequently enlarged to include plantations to study the hereditary character of individual variation. Bates early recognized the significance of seed source in its relation to forest planting, particularly as this affected sandhills and plains planting.

Another project of fundamental character, started in 1910 and continued through 1935, involved a study to determine the limiting climatic and edaphic factors affecting the distribution of forest types. This project involved the establishment and maintenance through the years of never less than 14 meteorological stations covering the altitudinal range of tree distribution in the Pikes Peak Region with outlying stations in Colorado, the Black Hills of South Dakota, and sandhills of Nebraska, and the Lake States.

Bates' early years at Fremont were beset with a certain degree of frustration owing largely to heavy personnel turnover and to the need for his devoting much time to chores of nonprofessional nature. He was an artisan of no mean ability and he loved to work with his hands in the construction crafts. He overcame the lack of funds for purchasing equipment to carry on scientific work by devising and even patenting gadgets, such as drafting boards, revolving tables, and various types of evaporimeters.

He was an excellent engineer, and had he applied himself to engineering he probably would have been outstanding in his field. His capacity for work, including writing up the results of his investigations in reports, articles, and bulletins, was enormous and he never spared himself. Because of his insistence on perfection, he was not an easy man to work with, and he had little patience with co-workers whom he con

sidered physically or mentally slug gardly.

In a sense Bates' intellectual at tributes set him apart from other re search workers and gave rise to an impression that he was uncooperative, stubborn, and a sort of crank. He was probably the most cosmopolitan and versatile of our pioneer silvicultural investigators insofar as the scope of his scientific interest was concerned. Being curious and with seemingly boundless imagination, he was inclined to be theoretical. Because he was engaged in developing a new science, he was intensely concerned with the necessary scientific biological bases for interpreting silvics in terms of practical silviculture. This explains his time devoted to biological investigations pertaining to the study of environmental conditions affecting forest types, transpiration, and water requirements of native conifers, the influence of light upon tree growth, and the effect and relation of soil composition and nutrients upon tree development.

He was willing to accept established theory carrying the weight of scientific opinion, such as was available to him, but he reserved to himself, in the face of administrative criticism and quite often striving against administrative control and direction, the right to seek out facts and to advance his own opinions even in the face of accepted theory. He did not fear to be different and to make mistakes. It was commonly agreed among the foresters with whom he was most closely associated that he was far ahead of his times.

Some of his worth-while contributions include his "Physiological Requirements of Rocky Mountain Trees" (Jour. Agric. Research, 1923, Vol. XXIV, No. 2), "Forest Types in the Central Rocky Mountains as Affected by Climate and Soil" (Dept. of Agric. Bul. 1233, 1924) and "Research Methods in the Study of Forest Environment" (Dept. of Agric. Bul. No. 1059), the last named in collaboration with Raphael Zon. Many of his publications, the last mentioned in particular, are too little known to present day foresters.

Concurrently with the establishment of the Fremont Station, the Forest Service in 1909 began a study of the effects of forest cover on streamflow and erosion under the conditions of the Central Rocky Mountains. The site selected for this experiment was Wagon Wheel Gap, Colorado, on the Rio Grande National Forest. This project, a cooperative study with the U. S. Weather Bureau, was terminated on October 1, 1926. Supervision of the project was almost entirely under Bates' direction, and he collaborated in the preparation of both the preliminary and final reports, which were published as monthly Weather Review Supplements. All laboratory work in connection with the project was done at Fremont.

The Wagon Wheel Gap experiment was the first comprehensive forest influences study undertaken in America. It established a pattern for subsequent studies, and the results had significant bearing on our present understanding of the influence of forests on streamflow and erosion.

In July 1927, Bates transferred to the newly created Office of Biological Research at the Forest Products Laboratory. Within a year, he again moved on, this time to St. Paul and the Lake States Experiment Station. Here he remained until his passing in 1949.

One of his first interests in the Lake States assignment was seed studies. He worked out the seed testing methods which were used at the Station's seed laboratory for many years. He did some of the initial work on dormancy of eastern white pine seed, and later experiments bore fruit as a basis for a considerable part of the *Woody Plant Seed Manual*.

He initiated seed source studies in red pine, Scotch pine, and the spruces of the Lake States. One of the early results was to demonstrate a relationship between seed origin and cold resistance of young red pine seedlings. As early as 1928 he attempted (without success) to cross-pollinate sugar maples for the bird's-eye character of their wood, evidence of his interest in the genetics field.

About 1930 his interest in forest influences led him to engage in gully control work in southeastern Minnesota and adjacent Wisconsin. This was another pioneering venture. His techniques were adopted by the Soil Conservation Service and other agencies. He developed several lysimeters to measure runoff and percolation under different types of ground cover. He also did a large amount of stream sampling and developed a device for obtaining water samples at any desired depth in a stream. From this work he estimated the silt load of various streams and pointed out those which presented the worst problems. Later flood control surveys followed up on his leads.

In 1934, the Lake States Station was given the assignment of providing technical guidance to the Great Plains Forestry Project just being initiated. It was natural for him to head up the work for the Station. He supervised a survey of the prairie-plains region to determine bases for successful shelterbelt establishment. Through his efforts, comprehensive studies were undertaken to determine the effects of different kinds of barriers on wind velocities and evaporation, the effects of shelterbelts on crop yields; likewise, the effects of shelterbelts on the heating requirements for buildings. He was working on reports of these studies at the time of his death.

During his tenure at the Lake States Station, Bates wrote some 40 technical papers which were published as government bulletins, periodical articles, or station releases. His output while at Fremont closely approximated this figure, if we include those that repose unpublished in the files.

Bates became a member of the Society of American Foresters in 1910, and was elected a Fellow in 1940. From 1925 through 1932 he served as associate editor of the Journal of Forestry for Dendrology, Silvics and Silviculture. In 1920 he was elected vice president of the Society. He served as chairman of the Central Rocky Mountain Section (1919) and the Minnesota Section (1930).

Despite an outward appearance of sternness and aloofness Carlos Bates was very human, and liked by those who managed to break through the somewhat austere crust of his personality. To many, his finest trait was his naturalness and his willingness to help his coworkers and to give credit for effort, intellectual as well as physical, without assuming any of it for himself.

Jacob Roeser, Jr.

Reviews

Scientific Writing

By Meta Riley Emberger and Marian Ross Hall. 468 pp. Illus. Harcourt, Brace, and Company. New York. 1955. $4.50.

Professional foresters and others working in the biological sciences will find much useful information in this excellent reference and text. Unlike many of the recent books on technical writing, it is not slanted primarily for engineers. As the title suggests, *Scientific Writing* deals with the writing problems common to all sciences.

Foresters, especially those in research or teaching, should be pleased to find that this book contains several excerpts from the literature of our own profession—a botanical description of basswood (*Tilia americana*); references to Larson's *Tables For Technical Writers* published by the U. S. Forest Service; and a pictorial graph by the American Forest Products Industries, Inc.

As emphasized in the foreword, scientific writing is "as much a way of thought as a mode of expression." Therefore, the first six chapters logically deal with the intellectual activity that must precede composition. Included in these chapters are discussions of problem concept, scientific method, definition, terminology, collection of data, analysis, logic, and interpretation.

The next three chapters cover problems of communication, scientific style, reader psychology, and techniques of exposition.

Chapters 10 through 15 treat the elements and structure of reports (both short and long form), research papers, abstracts, book reviews, and other scientific papers. The use of graphic and pictorial illustration is also discussed.

Scholarly, yet highly interesting, *Scientific Writing* is well documented with copious footnote citations—290 in all. Good format and design give effective emphasis to the text; illustrations are limited mostly to graphs and charts; and the index is adequate. Many carefully selected samples of scientific writing, as well as other useful information, are included in the 86-page appendix.

Unfortunately, the bibliography, a useful section that we ordinarily expect to find in a work of this caliber, is missing.

Parts of the book may be too advanced for use in undergraduate classes, but this does not lower its value as a reference for writers, editors, and scientists.

ELMER W. SHAW
Rocky Mountain Forest & Range Experiment Station

Publications of Interest

This is Tree Farming is a booklet designed to answer requests from landowners and the public for information about the Tree Farm program. Attention is directed particularly to the "Principles of the American Tree Farm System" as adopted by the Board of Trustees of A.F.P.I. on November 5, 1955 which is outlined on the inside of the back cover. Copies may be obtained by writing American Forest Products Industries, Inc., 1816 N St., N.W., Washington, D. C.

* * *

Fine Hardwoods Selectorama, a 57-page book, lists 398 hardwoods—contains 55 black and white illustrations and 38 full color plates. The book is prepared for industry and general usage. It gives these vital facts about more than 250 species: source, color, pattern, physical characteristics, uses, availability, and price range. Illustration plates show many woods in true-to-life, full natural color. *Selectorama* helps select the hardwood best suited to a purpose—in shade, lustre, grain or figure pattern, texture, price, etc. Priced at $1.50 per copy. Substantial discounts on 10 or more copies. Fine Hardwoods Association, 666 Lake Shore Drive, Chicago 11, Illinois.

* * *

An appraisal of conservation practices, manufacturing methods, and economic factors, in the wood-using industries of Europe and Scandinavia, is presented in a 16-page booklet, *European Trade Ways*, by Harry G. Uhl, president of Timber Engineering Company, research affiliate of National Lumber Manufacturers Association.

Mr. Uhl developed his appraisal in company with Carl A. Rishell, vice president, and Dr. Eduard Farber, chief chemist of the research organization, on an 18,000-mile tour of 11 countries abroad, investigating the highly advanced processes and equipment used in manufacturing particle board, hardboard, and other new wood utilization products.

The foreign study was made in behalf of some 25 U. S. lumber and furniture manufacturers who comprise the nucleus of one of the fastest growing wood industries in America.

Copies of the booklet are available, on request, from Timber Engineering Company, 1319 - 18th Street, N. W., Washington 6, D. C.

* * *

Tree Portraits, a 21 minute, 16 mm. sound-color film produced by Dr. William M. Harlow is a revelation of the beauty and colorful activity of trees. It is designed specifically to introduce school children and others to some important trees of the State of New York. It shows beautiful time-lapse pictures of buds unfolding—leaves and tree-flowers emerging; how to identify trees; the splendor of the woods in all four seasons; and has a stirring musical background. The film will be available to all interested persons in New York State and it can be loaned on a limited basis outside of the state to possible purchasers such as schools of forestry. Available by addressing the State University of New York, College of Forestry, Extension Department, Syracuse 10, N. Y. Purchase price: $125.00.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, State University of New York College of Forestry*
Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

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CORRECTION

In the February, 1956 issue of the JOURNAL, page 139, the citation, *A Review of the Charcoal and Marketing Situation in the U.S. with Reference to Minnesota.* By R. A. Shok and R. I. Beasley. (39 pp. Univ. of Minnesota School of Forestry. Mimeog.) should have been dated 1955 *not* 1935.

Society Affairs

Officers and Council
1956-1957

DEWITT NELSON, *President*
Department of Natural Resources
315 State Office Building 1
Sacramento 14, Calif.

B. E. ALLEN
Union Bag & Paper Corporation
P. O. Box 570
Savannah, Ga.

PHILIP A. BRIEGLEB
Southern Forest Experiment Station
704 Lowich Building
2026 St. Charles Avenue
New Orleans 13, La.

C. HUXLEY COULTER
Florida Forest Service
Tallahassee, Fla.

GEORGE A. GARRATT, *Vice President*
School of Forestry
Yale University
New Haven 11, Conn.

STANLEY G. FONTANNA
School of Natural Resources
University of Michigan
Ann Arbor, Mich.

MAURICE K. GODDARD
Department of Forests and Waters
Harrisburg, Pa.

EDWIN F. HEACOX
Weyerhaeuser Timber Company
Tacoma 1, Wash.

HENRY CLEPPER, *Executive Secretary*
Mills Building, 17th Street at Pennsylvania Avenue, N.W.
Washington 6, D. C.

JOSEPH S. ILLICK
College of Forestry
State University of New York
Syracuse 10, N. Y.

J. HERBERT STONE
U. S. Forest Service
729 N.E. Oregon St.
Portland 8, Ore.

HENRY J. VAUX
School of Forestry
University of California
Berkeley 4, Calif.

The President's Column

DEWITT NELSON

On February 19-21, the new Council held its first meeting—in New Orleans. This is the earliest date on which a new Council has met after being elected to office. By this early meeting we have been able to achieve continuity by continuing programs of previous Councils and initiating action on new projects.

As usual, the Council is representative of Society membership and interests. Its members come from forestry schools, federal, state, and industrial employment. Five of the members are now serving their first terms while six are carry-overs. This adds new ideas and perspectives as well as providing good continuity.

Business transacted dealt with finances (we are solvent), administrative problems, basic policy questions, and programs. For the details I refer you to the minutes of the Council meeting which appear in this issue of the JOURNAL.

I wish to comment on several items which I believe to be of general interest:

1. *Election of Fellows.*—For some time there has been a feeling throughout the membership that the outstanding achievements of many foresters have not been adequately recognized by the honor of election to the grade of Fellow. With a membership of 11,000 and fifty-five years of history, this honor has been bestowed on only 110 men of whom 76 are still living.

For the past two years, Joseph S. Illick and a committee have been making an exhaustive study and analysis of this problem. You will want to read his interesting report in the minutes.

In order to correct this situation and to more adequately recognize outstanding contributions by foresters, the Council took action. This action will require a referendum ballot by the membership. In brief it enlarges the electorate from the Council and Fellow membership to include the Section and Division chairman. It is believed that this will give a more comprehensive cross-section of the electorate than has heretofore been possible. There was a time when foresters knew each other personally. No longer is that possible. Forestry is on the march in all parts of the nation and our membership is growing rapidly. We hope that by expanding the electorate and by more complete biographical sketches of the nominees, more outstanding contributions to forestry may be recognized.

You will have an opportunity to discuss this in the JOURNAL, at the Memphis meeting in October, and to cast your ballot in December.

2. *Registration of foresters.*—Two states now have registration laws—Georgia and Michigan. Foresters in other states are interested in securing similar legislation. A committee has been appointed to study this problem for the purpose of developing the elements that such legislation should include. The recommendations of this committee should be very helpful to those states venturing into this field.

3. *Memphis meeting, October 14-17, 1956.*—The theme of this meeting will be "Forestry Faces Forward." General Chairman Russell Stadelman, and Program Chairman Philip A. Briegleb, report plans that will make this an outstanding meeting. There will also be excellent trips through industrial plants and into the field at the Hardwood Capital of the World.

In an effort to get more membership participation, we plan to combine the Section delegates meeting with the Society Affairs meeting during the first afternoon session. There will be a program for discussion in which you will want to join.

4. *General information.*—The October issue of the JOURNAL will be devoted to the Memphis meeting and will be in the mail as early as advertising schedules permit.

Sales of the *Forestry Handbook* have exceeded our expectations. It will soon go into a second printing.

Proceedings of the 1955 meeting at Portland are now off the press and

being distributed.

A new edition of *Forestry Terminology* will be published before long.

We need more "Forest Practice" articles for the Journal. Here is an opportunity for men in the industrial forest management field to let others know what they are doing and how they do it.

Report of Council Meeting

A meeting of the Council of the Society was held February 19, 20, and 21, in New Orleans, Louisiana.

All members were present as follows: President DeWitt Nelson, Vice President George A. Garratt, B. E. Allen, P. A. Briegleb, C. H. Coulter, S. G. Fontanna, M. K. Goddard, E. F. Heacox, J. S. Illick, J. H. Stone, and Henry J. Vaux; together with Henry Clepper, executive secretary.

State Registration of Foresters

Because of widespread interest in the Sections on the subject of state registration and licensing of foresters, the Council has been requested to arrange for the drafting of model legislation.

By motion of Mr. Heacox, seconded by Dr. Illick, the Council unanimously authorized the president to appoint a committee to study the principles and provisions of state registration and licensing. However, the Council does not believe that a model bill would be applicable in all states, hence the committee is requested simply to set forth guiding principles that might underlie such legislation.

Asked to serve on the committee were Julius Kahn, chairman; Archie Patterson, K. M. MacDonald, T. D. Stevens, and A. B. Hafer.

Appointment of Executive Secretary

Article VI, Section 2 of the Constitution provides, "The Executive Secretary shall be appointed by the Council which is empowered to enter into contractural relations with him during the period not exceeding two years for which he is appointed."

By motion of Dr. Illick, seconded by Mr. Goddard, the Council unanimously appointed Henry Clepper executive secretary for the two-year period 1956-1957.

Accredited Status of Pennsylvania State University Continued

In November 1955 the Society was invited by the Middle States Association of Colleges and Universities to participate in an examination of the Pennsylvania State University for accrediting purposes. The forestry curriculum at Penn State has long been approved by the Society, and there was no question of the University's accredited status.

However, in order to gain experience in cooperative accrediting evaluations as carried on by the several regional educational associations, the Society made an examination in the usual way, including a personal visit to the University by a visiting committee consisting of Frank H. Kaufert and Arthur B. Meyer.

The Society's Committee for the Advancement of Forestry Education then unanimously recommended to the Council to continue accreditation for the forestry curriculum.

By motion of Mr. Allen, seconded by Dr. Illick, the Council voted to approve the recommendation of the Committee for the Advancement of Forestry Education that the Pennsylvania State University be continued on the list of institutions accredited for education in forestry.

(Mr. Goddard abstained from voting on this issue as he is currently on leave of absence as director of the School of Forestry at Penn State.)

Accrediting in Related Fields

Recently, President Nelson received a suggestion that the Society, perhaps under contract, undertake accrediting of technical and professional curriculums in fields other than forestry. The Council is of the opinion that such activity would be outside the scope of the Society's objectives.

Accordingly, on a motion by Dr. Garratt, seconded by Mr. Goddard, the Council unanimously decided not to undertake accrediting in related fields, but authorized the officers of the Society and the Committee for the Advancement of Forestry Education to cooperate with other technical and professional societies in the evaluation of related curriculums.

Allegheny Section Bylaws

By vote of the membership of the Allegheny Section, the Section's bylaws were amended effective February 11, 1956. The amended bylaws were examined and determined to be not inconsistent with the Constitution and Bylaws of the Society.

On a motion by Mr. Goddard, seconded by Mr. Allen, the bylaws of the Allegheny Section were unanimously approved.

Public Relations Survey

At the Council meeting held June 14-15, 1955 the Division of Public Relations was requested to survey the devices used to publicize the Society and its work, with the general public, with the S.A.F. membership, and with prospective members. (See the Journal of Forestry for August 1955, page 606.)

C. W. Mattison, chairman of the Division has submitted the following proposed plan which the Council has approved.

1. Appoint a small committee of S.A.F. members to make the review.
2. Provide this committee with general guidelines for making the review, but give it full authority to develop its own procedures.
3. Request this committee to make a report for presentation to the Council at the annual meeting at Memphis this fall.
4. Design the program for the Public Relations Division at the Memphis meeting around the Council's request. This should be a valuable supplement to the Committee's more formal report.

Forestry Handbook

Arthur B. Meyer, editor of Society publications, presented the following report on the *Forestry Handbook*, published for the Society by Ronald Press Company of New York in 1955.

Estimated sales as of February 1, 1956 are 3,000 copies. It is indicated that most of these are full price sales. The Society has a charge of $1,380 entailed in preparation and some $9,500

expended over the years, or total of $10,880 invested in the *Handbook*. On the basis of estimates, it would seem likely that royalties may wipe out the investment within a year.

We have been asked to notify Ronald Press by April 1 of all known typographical errors discovered, preparatory to a second printing. Correction sheets and instructions have been sent the chairman or a member of each subject matter committee requesting return to me by March 15.

No revisions are permitted at this time. Suggestions are to be kept in mind for consideration at a later date when a sufficient number are available "to make a substantial improvement in the book."

It is my opinion that three or four of the sections should ultimately be completely revised and modernized, that the book should be given a 10 to 25 percent reduction in total length, that sections should be further standardized, and that such work should be carried out by not more than one or two men per subject matter division. Preliminary steps for revision should be undertaken immediately, setting a goal of not later than 1958.

I would like to go on record to the effect that our work with Ronald Press has been most satisfactory. They have been considerate, cooperative, and in fact generous with the S.A.F. in this publication undertaking.

Executive Office: Salaries and Work-Load of Staff

A special Committee on Society Administration was authorized by the Council in 1955. The members were C. M. Granger, chairman, Gordon D. Fox, and the late Norman Munster.

The assignment given the Committee was "to study and analyze the work performed by the executive office, the organization needed, and the Society's existing personnel policy." The Committee's report included the following matters which were discussed by the Council and acted on.

1. An analysis was made of job descriptions and work performed by each employee of the Society. Salaries paid Society employees were compared with corresponding grades and salaries of the federal government. In most cases the salaries paid by the Society were markedly lower than comparable salaries in federal service.

In order to bring Society salaries more nearly in line with those of government, the Council unanimously voted to increase S.A.F. staff salaries in accordance with the findings of the Granger committee. This action was taken on the motion of Mr. Goddard, seconded by Mr. Fontanna.

The revised salaries, effective March 1, 1956 are embodied in the annual budget published elsewhere in this report of the Council meeting. Although in most instances the S.A.F. salaries are still lower than comparable federal salaries, they are a distinct improvement in the Society's personnel policy.

2. The Granger committee surveyed the work-load of the executive secretary, and recommended the employment of a young professional forester to assist in handling routine activities of a professional nature that at present cannot be delegated because there is no one on the staff available.

With respect to the work-load of the editor, the Committee found that he was spending a large amount of time on editorial activities, such as the *Forestry Handbook*, not connected with the JOURNAL OF FORESTRY, and performing work of a routine nature, such as proofreading. In order to permit the editor to spend more time on the JOURNAL, "in the interest of making and keeping it a high-quality professional publication meeting the needs of the profession," the Committee recommended that the Council should give consideration to supplying the editor with an assistant.

Two assistants, one each for the executive secretary and the editor, are financially out of the question. Hence, on motion by Mr. Goddard, seconded by Mr. Heacox, the Council authorized the employment of a special staff assistant, on or after July 1, 1956, at annual salary not to exceed $6,000, and that the budget be increased accordingly when the appointment is made.

Proceedings of 1955 Meeting

Editor Meyer reported that the *Proceedings* of the 1955 meeting should be printed and available for distribution in April.

He further reported that, "Meeting paper authors were somewhat more prompt this year than last in returning galley. It is in the realm of possibility to get out a *Proceedings* within three months after an annual meeting if it were possible to give fuller attention to the task and if a reasonable number of papers were received in advance of the meeting and not subsequently changed on presentation.

"The format of 1955 *Proceedings* is the same as 1954. Presentation is also again a compromise between a verbatim transcript and a tightly edited publication. Certain extraneous material was deleted, grammatical mistakes were corrected, and some effort made toward better reading, but in general it was meant that the *Proceedings* should reflect the meeting as truly as possible.

"The number of pages, not counting short index, is 204."

Registration Fee for Annual Meeting

By motion of Mr. Allen, seconded by Mr. Heacox, the Council determined that the registration fee for the annual meeting to be held in Memphis, October 14-17, 1956, shall be $6.

Of this amount approximately $4 will be earmarked to pay for the cost of the *Proceedings*, a copy of which will be sent to each registrant. The balance will be needed to underwrite the general costs of the meeting.

Budget for Annual Meeting

In order to enable the several committees that arrange an annual meeting to make financial as well as other plans, Mr. Stone made the following motion, which was seconded by Mr. Allen and unanimously approved.

> It is the sense of the Council that the general chairman of the meeting committees should have a reasonably firm maximum expenditure against which to plan. The executive secretary is authorized to set such a figure after consultation with the general chairman and at an appropriate time.

Contract with International Cooperation Administration

The International Cooperation Administration, an agency of the federal government, has requested the aid of the Society to establish, for overseas foresters who have shared in the training conducted in the United States by I.C.A. or its predecessor agencies, continuing professional follow-up. The aid would consist primarily of making the JOURNAL OF FORESTRY available under a form of payment by which the subscriber would pay a portion of the subscription price and the government would pay the balance. Such overseas subscribers would be elected Corresponding Members, as provided in the Constitution and Bylaws.

On motion by Mr. Goddard, seconded by Mr. Briegleb, the Council unanimously authorized the executive secretary to enter into a contract with the International Cooperation Administration for a period of three years for the stated purpose.

Memorial to Col. Greeley

In view of the fact that William B. Greeley, who died November 30, 1955 was a Fellow of the Society, a former President (1912), and Council member for nine years, it has been proposed that some special form of memorial be arranged.

On motion by Mr. Allen, seconded by Mr. Stone, the Council unanimous-

ly authorized a committee to consider a form of suitable memorial to Col. Greeley and to make recommendations therefor.

President Nelson appointed the following committee of Council members: E. F. Heacox, chairman, J. H. Stone and G. A. Garratt.

Forest Science

S. H. Spurr, editor of *Forest Science*, reported that the four issues comprising Volume 1, published in 1955, cost $8,190. Income, mainly from subscriptions and sale of reprints, totaled $11,000, leaving a net balance of $2,810 to be applied against expenses for Volume 2.

Circulation during 1955 reached 1,224.

The estimated expense of publishing Volume 2 (1956) is $11,760. Of this amount the Council specifically approved an item of $600 for the employment by the editor of hourly help in proofreading and routine editorial assistance.

On motion by Mr. Fontanna, seconded by Dr. Garratt, the Council unanimously commended Dr. Spurr for his meritorious service to *Forest Science*.

Election of Fellows

Early in 1955 the Council authorized a special committee to make a study of the procedure for electing Fellows. Establishment of this committee resulted from some dissatisfaction among the Members (formerly Senior Members) and Fellows who alone are entitled to nominate Fellows. Appointed to the committee were J. S. Illick, chairman; W. J. Brown, and S. G. Fontanna.

Two preliminary reports were made to the Council by Dr. Illick at the meeting of June 14 and 15, 1955 and the meeting of October 16, 1955.

At the Council meeting of February 19-21, 1956 Dr. Illick submitted a final report in behalf of the committee, which made four major recommendations, summarized as follows:

1. A digest of the information assembled regarding the Fellow situation shall be made available to all members of the Society, and special consideration shall be given to making this information available in greater detail to the Board of Electors for Fellows. (Note: Dr. Illick will prepare the digest for publication in an early issue of the JOURNAL.)

2. A deliberate attempt shall be made to clarify and amplify the provisions of the Constitution and Bylaws regarding Fellows. (Note: suggested improvements are contained in the proposed amendments to the Constitution and Bylaws.)

3. Some improvements shall be recommended in *nominating* procedure and practices regarding Fellows. (Note: see proposed amendments.)

4. Urgently needed improvements shall be recommended in *election* procedures and practices regarding Fellows. To help achieve these desirable objectives, it is recommended that the Board of Electors for Fellows be enlarged.

AMENDMENTS TO CONSTITUTION

Article III, Section 7 of the Constitution is as follows: "Fellows shall be foresters of outstanding achievement as leaders in responsible directive positions or distinctive individual work of a fruitful character. They shall be elected from the Members and shall be engaged in forestry work at the time of their election."

The foregoing provision has been widely criticized as vague and not sufficiently specific. The Council voted unanimously to submit to the voting membership by mail ballot a substitute for Article III, Section 7, as follows:

"Fellows shall be foresters recognized generally throughout the profession as persons who have rendered outstanding service to forestry and to the Society. They shall be elected from the Members."

Article IV, Section 3 is as follows: "Nomination to the grade of Fellow shall be by the written endorsement of twenty-five Members and Fellows."

For the purpose of clarification, and in order to provide that all endorsements may be by Members or all by Fellows, the Council unanimously proposes the following amendment for approval by mail ballot.

"Nominations to the grade of Fellow shall be made by the written endorsement of twenty-five Members and/or Fellows."

Article IV, Section 4 is as follows: "Election to the grade of Fellow shall be concurrent with the election of officers by letter ballot of the members of the Council and Fellows. The ballots may be counted by any system of preferential voting which the Council may prescribe provided each candidate elected thereunder shall be required to receive an affirmative vote of not less than one-half the total vote cast."

In order to carry out the special committee's recommendation 4, the Council unanimously approved the following substitute for Article IV, Section 4 to be submitted to the voting membership by mail ballot.

"Election to the grade of Fellow shall be concurrent with the regular biennial Council election, and shall be by letter ballot of the Fellows, the members of the Council, the chairmen of the Sections, and the chairmen of the subject Divisions. The total number of votes necessary to elect shall be determined by the Council as provided in the Bylaws."

The foregoing proposed amendment would accomplish two improvements. First, 21 Section chairmen and 11 Division chairmen (a total of 32) would be added to the Board of Electors. In 1955, the average age of these 32 chairmen was 46 years.

Secondly, the number of votes necessary to elect could, if desirable, be changed by the Council to take care of special conditions. In recent years, the number of votes necessary to elect was one-half the total number of ballots cast. The Council does not now propose to lower this number; the amendment is simply permissive.

AMENDMENTS TO BYLAWS

The following proposed amendments to the Bylaws have received the unanimous approval of the Council. These Bylaws will go into effect as and when the foregoing proposed amendments to the Constitution have been approved by mail ballot of the voting membership.

The referendum will be held during the latter months of 1956.

The Constitution may be amended by a two-thirds vote of the members voting, provided the proposed amendments have been submitted to all voting members at least four weeks in advance of the date set by the Council for counting the ballots.

Bylaw 9 sets forth the requirements for Fellow as follows: "The prescribed eligibility requirements for Fellow indicate that a candidate's record and reputation should be well known among Members and Fellows, who alone are entitled to vote for these candidates. Such candidates should be selected from among the most widely known Members, whose professional service has been exceptionally outstanding."

In order to clarify the eligibility requirements, the Council proposes to amend Bylaw 9 as follows:

"Meritorious contributions to forestry, the basic requirement, shall include contributions to the application of forestry in any of its branches, to education, to research, to the ad-

TABLE 1.—MEMBERSHIP BY SECTIONS (DECEMBER 31, 1955)

Section	Rank	Total	Junior	Member	Fellow	Affiliate	Associate	Student
1. Allegheny	7	627	298	250	4	16	15	44
2. Appalachian	5	709	316	304	5	25	5	54
3. Central Rocky Mountain	15	250	88	132	1	4	2	23
4. Central States	12	417	189	143	1	16	10	58
5. Columbia River	2	1,025	522	388	5	55	17	38
6. Gulf States	3	834	401	248	2	94	21	68
7. Inland Empire	20	205	99	77	2	9	6	12
8. Intermountain	19	209	79	101	1	4	1	23
9. Kentucky-Tennessee	18	221	95	108	0	10	8	0
10. New England	9	603	213	246	7	61	16	60
11. New York	10	440	155	198	5	16	16	50
12. Northern California	4	758	335	306	10	47	22	38
13. Northern Rocky Mountain	16	241	100	100	0	9	4	28
14. Ozark	13	396	172	124	1	56	5	38
15. Puget Sound	8	624	278	227	5	62	12	40
16. Southeastern	1	1,081	605	333	2	42	19	80
17. Southern California	21	117	61	45	2	6	3	0
18. Southwestern	17	222	102	98	1	19	2	0
19. Upper-Mississippi Valley	11	420	165	158	4	18	13	62
20. Washington, D. C.	14	257	44	172	12	2	27	0
21. Wisconsin-Michigan	6	666	252	261	4	49	11	89
No Section Affiliation[1]		201	78	115	2	4	2	0
Corresponding Members		69	—	—	—	—	—	—
Honorary Members		19	—	—	—	—	—	—
Total Membership		10,611	4,647	4,134	76	624	237	805

[1]Includes members in U.S. and foreign countries who have requested that they not be designated as members of any Section.

vancement of the profession, and service to the Society."

Bylaw 10 is as follows: "A petition nominating a Member for Advancement to Fellow must be accompanied by a biographical sketch of the candidate, including a brief account of his professional career and accomplishments. A sketch of biographical facts not exceeding 200 words shall be printed for each nominee for the grade of Fellow."

In order to define the kind of biographical information of most value to the electors when voting on nominees for Fellow, the Council would substitute the following version for Bylaw 10:

"With each petition nominating a Member for advancement to Fellow must be submitted an adequate biographical sketch of the nominee, including a record of his education and training, professional responsibilities and achievements, previous special awards and honors, services to the Society, and other significant contributions and services. A factual biographical summary of each nominee, containing not more than 300 words, shall accompany the ballot."

A new Bylaw has been proposed by the Council to implement the recommended amendment of Article IV, Section 4:

"The total number of votes necessary to elect a Member nominated to the grade of Fellow shall be not less than 50 percent of the total number of votes cast."

This bylaw provides for the same number of votes to elect as is now provided in the Constitution.

Anonymous Memorial Award Fund

At a meeting of the Council of the Society on June 14, 1954, S. T. Dana presented plans in behalf of an anonymous donor for the establishment of a trust fund to finance a memorial award for outstanding research in the biological sciences. He asked Dr. Dana to act as his agent in setting up the fund, and $10,000 was made available for this purpose.

The grant was made under the following terms and conditions, to which the Council had already agreed:

> In consideration of the payment of $10,000 by an anonymous donor, receipt of which is hereby acknowledged, the SOCIETY OF AMERICAN FORESTERS hereby agrees with the said donor, his or her heirs, executors and administrators to hold the said sum as a trust fund upon the following terms and conditions:
>
> 1. The said fund is to be known as THE MEMORIAL AWARD and the principal thereof is to be invested and reinvested in perpetuity by the directors or governing body of the said SOCIETY OF AMERICAN FORESTERS in such investments as they shall approve without limitation.
>
> 2. The income from the said fund is to be applied for the payment of Awards, which shall be in the form of cash payments, not necessarily the same in amount for each Award, and a medal or a certificate comparable to an honorary degree diploma, whichever the governing body of the Society considers more appropriate. Each Award is to be made at such time as may be determined by the governing body of the Society in the light of suitable candidates and available funds.
>
> 3. The recipient (or recipients) of the Award shall be selected by the governing body of the Society, with such advisory assistance from within the United States or elsewhere as it may wish, in recognition of outstanding achievement in basic or applied research in any branch of the biological sciences, provided the research contributes, either directly or indirectly, to the advancement of forestry. For the purposes of this Award, the biological sciences shall be interpreted as including those aspects of wood technology that are not essentially engineering in character.
>
> 4. Persons in any country and of any race, color, or creed shall be eligible for an Award.

On November 25, 1955, Dr. Dana sent the following letter to E. L. Demmon who was then president of the Society:

> The donor of the fund to finance THE MEMORIAL AWARD "in recognition of outstanding achievement in basic or applied research in any branch of the biological sciences" feels that the recent publication of the Society's report on forestry research might make this an appropriate time to announce the Award and to arrange for its first presentation at next year's annual meeting of the Society. The two events coming so close together should help to emphasize both the importance of research in forestry and the influential part being played by the Society in its development.
>
> If the proposal meets with the approval of the Council, the announcement could be made at any time, with the understanding that the names of the donor and of the person for whom the Award is to be named will not be made public until after the decease of the latter. Presumably the Council will appoint a committee to administer the Award, and it might wish to announce the grant and membership of the committee simultaneously. If you will let me know your wishes and plans in the matter, I shall be glad to transmit them to the donor.

To this letter, President Demmon replied that he would request authority from the Council to proceed in accordance with the donor's wishes. This authority was unanimously granted by the past Council, which body, about to go out of office, referred the matter to the incoming Council for action.

Acting as a committee of the whole the Council selected two persons to receive the first awards in 1956. The presentations will be made at the Society's annual dinner in Memphis on

October 17. The names of those to receive the awards will not be made known until the day of presentation. This action was by unanimous vote of the Council, on motion by Mr. Fontanna, seconded by Mr. Allen.

On motion by Mr. Coulter, seconded by Mr. Goddard, the Council unanimously voted to establish a plaque, to be especially designed for that purpose, to be a part of the award, in addition to cash payments. B. E. Allen and Henry Clepper were requested by President Nelson to serve as a committee to design the plaque.

On motion by Dr. Vaux, seconded by Mr. Heacox, the Council unanimously authorized the President to appoint a standing committee of the Council whose duties it will be to consider eligibles for the award, to prepare not less than three nominations supported by biographical and explanatory documentation, and to submit the data to the Council at its first meeting of each year or not later than July 1. Each nomination shall also recommend the amount of the award.

President Nelson thereupon appointed the following Council members to the Committee on the Memorial Award: S. G. Fontanna, chairman, P. A. Briegleb and E. F. Heacox.

Finally, on motion by Dr. Garratt, seconded by Mr. Coulter, the Council unanimously authorized the treasurer (executive secretary) to withdraw earned income from the fund to finance the awards.

Amendment of Bylaw 64

Bylaw 64 is as follows: "The funds of the Society shall be deposited in a bank, approved by the Council, or invested in federal securities. This bylaw shall not be retroactive as ordering the sale of existing securities and reinvestment."

In order to obtain additional income from the higher interest rates paid by building and loan associations whose accounts up to $10,000 are insured by the government, by motion of Mr. Stone, seconded by Mr. Fontanna, the Council unanimously amended the bylaw to read as follows: (amended portion in boldface).

"The funds of the Society shall be deposited in a bank approved by the Council, or invested in federal securities **or in a building and loan association up to insurable limits.** This bylaw shall not be retroactive as ordering the sale of existing securities and reinvestment."

This amendment implements a previous action by the Council at its meeting June 14 and 15, 1955, as reported in the JOURNAL on pages 602-603 of the August, 1955 issue.

TABLE 2.—1955 INCOME AND EXPENSE AND 1956 BUDGET

Item	1955	Budget 1956
INCOME		
Dues	$ 92,496	$ 95,000
Fee	1,635	1,700
Subscription, sales JOURNAL OF FORESTRY	9,310	9,500
Advertising	27,358	28,500
Interest and dividends	701	800
Miscellaneous income	4,609	4,000
	$136,109	$139,500
EXPENSE		
JOURNAL OF FORESTRY	42,179	45,500
Editor's expense	615	650
Salaries, editorial	11,042	11,862
Salary, executive secretary	10,000	10,375
Salaries, office	26,451	32,100
Advertising commission	8,792	9,000
Advertising promotion and expense	3,055	3,500
Travel, officers	3,364	3,000
Postage	2,688	3,000
Telephone and telegraph	710	800
Rent	6,318	6,318
Mimeograph and multigraph	633	700
Miscellaneous printing	1,106	1,200
Office supplies	962	1,200
General expense	904	1,100
Depreciation	1,443	1,600
Retirement plan	1,528	1,480
Retirement plan, reserve	585	633
Affiliation dues	110	160
Committee expense	82	50
Grading forestry schools	415	500
Council travel	1,264	1,500
Division expense	40	50
Social security tax	790	900
Election of officers and Fellows	801	----
Forest Service dinner	100	----
Proceedings	530	----
Maintenance of equipment	473	600
National Research Council	100	----
Miscellaneous	3	200
	$127,083	$137,978

Membership

The executive secretary reported on membership as of December 31, 1955.

During the past five years membership increased annually as follows:

1951	8,472
1952	9,087
1953	9,557
1954	9,919
1955	10,611

With the continued cooperation of the Section and Chapter membership committees, the schools, and all members generally, total membership should exceed 11,000 by the end of 1956.

Membership by Sections is shown in Table 1.

Budget

Table 2 shows the treasurer's report for the fiscal year December 1, 1954-November 30, 1955, as audited by McGinley & McGinley of Washington, D. C., certified public accountants.

Also shown in Table 2 is the proposed budget for the fiscal year 1956 giving estimated receipts and expenditures.

Actually, it should be understood that the Society's budget is at best merely a financial plan since receipts cannot be accurately estimated a year in advance. In approving the budget the Council requests the executive office to make every effort to confine expenditures to income.

Forestry in Soil Conservation Service

The following resolution was adopted January 28, 1956 at a meeting of the Appalachian Section in Durham, N. C.:

WHEREAS the Soil Conservation Service is a federal agency whose pri-

mary responsibility to cooperating landowners is the preparation of complete farm plans promoting the application of proper soil and water conservation practices;

AND WHEREAS the Soil Conservation Service has performed a valuable service to farm forestry in disseminating forestry information to farm woodlot owners and in assisting farmers in carrying out reforestation, fire protection, and protection from woodland grazing;

BUT WHEREAS the Soil Conservation Service has used farm planners who are not professional foresters in teaching and performing technical forestry practices on farm woodlands; and inasmuch as the practical application of any management system and related silvicultural treatments varies from tract to tract to the extent that the services of a professional forester are needed to properly handle individual farm woods;

BE IT THEREFORE RESOLVED that the Appalachian Section of the Society of American Foresters requests the Soil Conservation Service to desist from the use of said farm planners in the interpretation and application of thinnings, salvage, release, and crop tree methods of cutting with general methods of application as embodied in Section "C" of the "Farm Planners Guide for Woodland Planning."

AND BE IT FURTHER RESOLVED that this resolution be forwarded to the Council of the Society of American Foresters, urging their immediate consideration of this matter and appropriate action to correct this situation.

A similar resolution, as follows, was adopted by the Allegheny Section at its meeting in Harrisburg, Pa. on February 11, 1956.

WHEREAS, the Soil Conservation Service is a federal agency whose primary responsibility to cooperating land owners is the preparation of complete farm plans promoting the application of proper soil and water conservation practices;

AND WHEREAS, the practical application of any woodland management system and related silvicultural treatments vary from tract to tract to the extent that the services of a professional forester are needed to properly handle individual farm woods;

AND WHEREAS, the Soil Conservation Service is in a favorable position to promote farm forestry through the use or recommendation of presently organized State Forestry Departments, The United States Forest Service, and consulting foresters;

BE IT THEREFORE RESOLVED that the Allegheny Section of the Society of American Foresters requests the Soil Conservation Service to recognize that since the farm woodlot problem is of such a magnitude and diversity it requires the use of a professionally trained forester;

AND BE IT FURTHER RESOLVED that this resolution be forwarded to the Council of the Society of American Foresters, urging their immediate consideration of this matter and appropriate action to correct this situation.

In addition to the two foregoing Section resolutions, the South Carolina Forestry Committee and the North Carolina Forestry Council have recommended that the forestry services of nonprofessional S.C.S. farm planners should not include any silvicultural treatment of farm woodland.

By motion of Mr. Stone, seconded by Mr. Coulter, the Council unanimously directed the President to transmit copies of the two Section resolutions to the administrator of the Soil Conservation Service, and to express the strong position of the Society against nonprofessional workers of public agencies carrying on silvicultural practices and similar forestry work.

A National Conference on Forestry Research

At the Council's meeting on June 14 and 15, 1955, unanimous approval was given the formation of a committee (Clepper, Demmon, and Kaufert) to

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explore the possibilities for holding a Society-sponsored national conference on forestry and related research. Such a conference was recommended in the book *Forestry and Related Research in North America*, published by the Society in 1955.

On motion by Dr. Garratt, seconded by Mr. Allen, the Council unanimously reaffirmed the action of the previous Council to sponsor a national conference on forestry and related research. An application has been made to one of the foundations for a grant to finance the cost of the conference, proposed for 1957.

Students' Page in Journal

At the suggestion of a faculty representative for Student Membership at one of the accredited schools of forestry, the Council was asked to consider the establishment of a "students' page" in the Journal of Forestry.

It was brought out that most forestry schools have publications issued by the forestry clubs to which students are encouraged to contribute. In addition, the Journal now publishes appropriate items about the schools, together with news about student scholarships and fellowships.

Accordingly, by motion of Mr. Stone, seconded by Mr. Goddard, the Council unanimously expressed appreciation for the suggestion, but decided a "students' page" was not warranted at this time.

National Conservation Memorial Commission

A joint resolution has been introduced in the Senate and the House of Representatives of the Congress "to provide for the observance and commemoration of the fiftieth anniversary of the first conference of state governors for the protection in the public interest of the natural resources of the United States."

The resolution would establish a National Conservation Memorial Commission to plan for the observance of the fiftieth anniversary in 1957, the House joint resolution of February 8 is number 525; the Senate joint resolution of February 7 is number 139.

Because previous versions of the resolutions contained statements and dates that were historically inaccurate, it was the consensus of the Council that the executive secretary use discretion in participating with the sponsors of the legislation to achieve the objectives for which the Commission is being established.

Joint Meeting of Council and Section Delegates

It was decided that the usual joint conference of the Council and Section delegates, to be held at the time of the annual meeting in Memphis, be combined with the Society Affairs session scheduled for October 15.

Topics for discussion at this session will be (1) a proposed increase in dues (now $6) for Affiliate and Associate Members; and (2) possible elimination of Bylaw 75 which provides for Associate Members of Sections who are not members of the Society.

There will be no joint meeting of the Council and Section delegates on Sunday night, October 14.

Committee on History

Communications were read from E. N. Munns, chairman of the Committee on the History of Forestry, and from Elwood R. Maunder, director of the Forest History Foundation, Inc.

The Society is attempting, thus far without success, to obtain outside financial assistance to enable the committee

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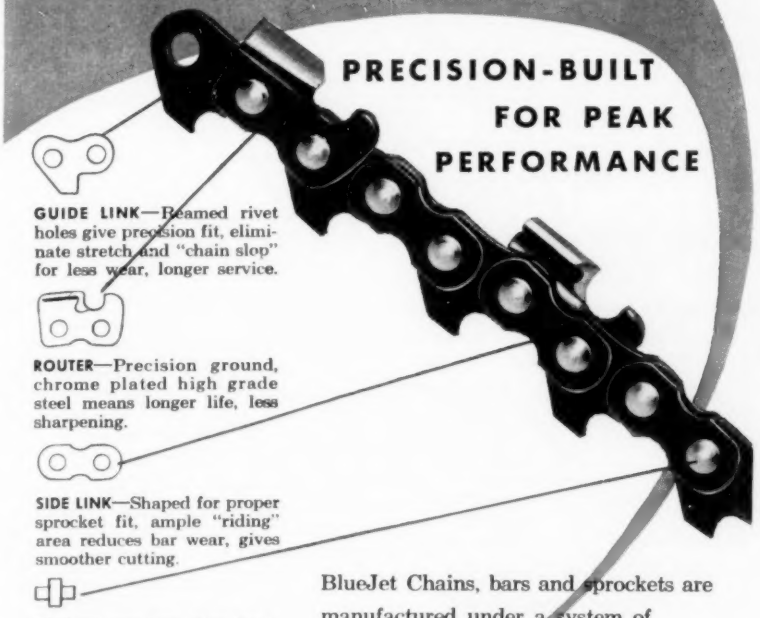

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Resolution on Aerial Photographs

The following resolution was received from the Columbia River Section's Willamette Chapter.

WHEREAS, presently foresters are large users of aerial photography and are continually finding further uses;

WHEREAS, foresters feel the need of having all vertical aerial photographs marked in some manner to show approximate north, the month and year of photography, and the name and address of the person or company from which additional copies can be secured;

THEREFORE, the Willamette Chapter of the Columbia River Section of the Society of American Foresters recommends to its members that in making future contracts for aerial photography the specifications should require the marking of each print or negative with approximate north indicated on the image surface and should require the month and year of photography along with the name and address of the person or company from which additional copies may be secured be indicated on the reverse side of each print. And that the secretary be instructed to send a copy of this resolution to each Chapter of the Columbia River Section, to the Council, and to the Columbia River Section of the American Society of Photogrammetry.

By motion of Mr. Stone, seconded by Mr. Heacox, the executive secretary was instructed to bring the resolution to the attention of the American Society of Photogrammetry for appropriate action.

Miscellaneous

The Council endorsed the purpose and objectives of the Southern Forest Fire Prevention Conference, scheduled to be held in New Orleans April 13 and 14.

The Council approved a joint meeting with the Canadian Institute of Forestry, to be held in the United States in 1959 or 1961, provided the C.I.F. accepts the Society's invitation.

Society Committees and Representatives

1956

Committee for the Advancement of Forestry Education

Harold G. Wilm, chairman; College of Forestry, State University of New York, Syracuse 10, N. Y.
George B. Hartman
C. M. Kaufman
W. F. McCulloch
Ernest Wohletz

Committee on Civil Service

R. J. Preston, chairman; School of Forestry, North Carolina State College, Raleigh, N. C.
M. K. Goddard
L. M. Turner
Albert C. Worrell
John A. Zivnuska

Committee on Ethics

George A. Garratt, chairman; Yale University School of Forestry, New Haven 11, Conn.
Julius Kahn
A. D. Nutting
Archie E. Patterson
Howard A. Post

Committee on History of Forestry

E. N. Munns, chairman; 1639 Garnet Lane, Concord, Calif.
E. H. Frothingham
W. L. Hall
Ralph S. Hosmer
William D. Miller
Roland Rotty
R. K. Winters
W. L. Schipull

Committee on International Relations

V. L. Harper, chairman; Forest Service, U. S. Department of Agriculture, Washington 25, D. C.

Committee on Library of Congress Photograph Collection

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John R. Meyerling
J. Kenneth Pearce

Committee on Tree Nomenclature

W. A. Dayton, chairman; Forest Service, U. S. Department of Agriculture, Washington 25, D. C.
Henry I. Baldwin
Keith W. Dorman
John W. Duffield
Philip J. Haddock
Elbert L. Little

Committee on the 1956 Meeting

Russell Stadelman, general chairman; Nickey Brothers, Inc., 2700 Summer Avenue, Memphis 12, Tenn.

PROGRAM

Philip A. Briegleb, chairman; Southern Forest Experiment Station, 2026 St. Charles Avenue, New Orleans 13, La.
Glen R. Durrell
Richard Kilbourne
Charles H. Kirk
Harrod B. Newland

ARRANGEMENTS

George C. Romeiser, chairman; Southern Hardwood Producers, Inc., Sterick Building, Memphis, Tenn.
J. Wilbur Vaughn, vice chairman.
Other personnel to be announced.

Collating Committee on Grade Standardization of Forest Planting Stock

J. H. Stoeckeler, chairman; Lake States Forest Experiment Station, Rhinelander, Wis.

Council Committee on Membership

Henry J. Vaux, chairman; School of Forestry, University of California, Berkeley 4, Calif.
B. E. Allen
E. F. Heacox

Joint Committee on Fire Control Equipment with American Society of Mechanical Engineers

A. A. Brown, chairman; U. S. Forest Service, Washington 25, D. C.
Charles S. Cowan (W. D. Hagenstein, alternate).
W. E. McCraw
Gilbert I. Stewart

Representatives to the Logging and Sawmill Safety Code Committee, National Bureau of Standards

E. T. Clark, Pacific Northwest Loggers Association, White-Henry-Stuart Building, Seattle 1, Wash.
Seth Jackson, U. S. Forest Service, Washington 25, D. C.

Council Committee on Memorial Award

S. G. Fontanna, chairman; School of Natural Resources, University of Michigan, Ann Arbor, Mich.
P. A. Briegleb
E. F. Heacox

Committee on State Registration of Foresters

Julius Kahn, chairman; 36 West 44th Street, New York 36, N. Y.
K. M. MacDonald
Archie Patterson
T. D. Stevens
A. B. Hafer

Representative to the National Research Council Division of Biology and Agriculture

Harold G. Wilm, College of Forestry, State University of New York, Syracuse 10, N. Y.

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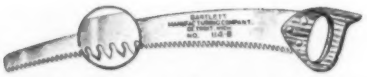

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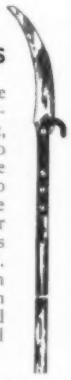

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E. A. Johnson, secretary; Coweeta Hydrologic Lab., U. S. Forest Service, Rt. 1, Dillard, Ga.

Editorial Board Changes Announced

President DeWitt Nelson has appointed three new members to the editorial board of the JOURNAL OF FORESTRY.

Dr. R. Keith Arnold, chief of the Division of Fire Research of the California Forest and Range Experiment Station, Berkeley, has been appointed associate editor for *Forest Fire*. He succeeds Charles C. Buck, who has held that assignment since 1951.

Dr. Edward A. Colman, also of the California Forest and Range Experiment Station, in charge of watershed management research, becomes the associate editor for *Watershed Management*, succeeding Marvin D. Hoover who has served since 1954. The subject matter designation of this editorial post has been changed to the foregoing from the previous title of *Forest Influences and Soils* in recognition of the need for emphasis on the vital role of forests in conserving the nation's water resources and in further recognition of the scope of that subject.

Dr. Charles E. Poulton, associate professor of range management at Oregon State College, Corvallis, has been appointed associate editor for

R. Keith Arnold

Charles E. Poulton

Range Management. He succeeds Harold H. Biswell, editorial board member since 1950.

R. Keith Arnold, prior to his present position, was in charge of fire research and taught fire control at the University of California School of Forestry from 1946 to 1955. During the period of 1951-1953 he was in charge of a special fire research project involving military and civil defense aspects of forest fire. In 1954 he served as manager of "Operation Firestop," a seven-agency fire research program. He served with the Navy from 1943 to 1946 in anti-submarine warfare research and equipment development.

Edward A. Colman has been in charge of watershed management at the California Forest and Range Experiment Station since 1949 and connected with that work since 1933. He is a 1932 forestry graduate of the University of California and received his Ph.D. in soil science from that institution in 1942. Dr. Colman is author of numerous papers in the fields of soil physics and watershed management and of the book *Vegetation and Watershed Management*, published in 1953 by The Ronald Press Company.

Charles E. Poulton has been associate professor in charge of the range management program for Oregon State College and the Agricultural Experiment Station, doing both research and teaching, since 1949. He is a 1939 forestry graduate of the University of Idaho, subsequently receiving his Ph.D. degree in 1955 from Washington State College. Prior to entering the teaching field, Dr. Poulton spent six years in forest administration with the U. S. Forest Service in several western states as well as one year at the Intermountain Forest and Range Experiment Station. His work with the Forest Service was interrupted by one year in the U. S. Navy. He resigned from the Forest Service in 1947 as a district ranger and was a member of the teaching staff at Montana State College and the University of Idaho before going

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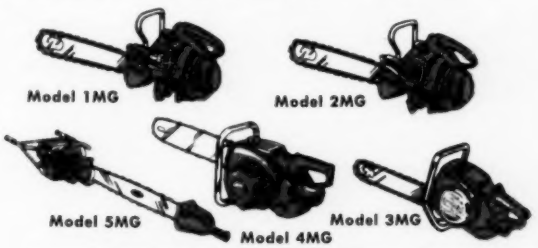

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FIRST NAME IN HERBICIDES

to Oregon State College. He is past secretary, vice chairman, and chairman of the Division of Range Management of the S.A.F.

As this issue of the JOURNAL *went to press, word was received of the untimely death of Dr. Colman. His obituary will be published in the May issue, but in this issue we have retained his name in the listing of the editorial board and have allowed the above news item to stand as written.*

Inland Empire Winter Meeting

The Inland Empire Section, Society of American Foresters, met January 21, 1956, at the Davenport Hotel, Spokane, Wash. Seventy-two members were in attendance. Section Chairman Douglas Hole presided.

Business affairs included passage of an amendment of the by-laws changing the term of office of Section officers in accordance with a request by the Council of the S.A.F. The term "year" in this connection now covers the period from July 1st of one year to June 30th of the ensuing year.

Principal discussion evolved about the report of the Forest-Tax Subcommittee under the chairmanship of Royce Cox. The committee was commended for its fine work and asked to continue. By a unanimous vote its status was changed to a full-fledge committee called the Forest Tax Committee.

A group of speakers reported upon activities of the recent S.A.F. Annual Meeting in Portland, Ore.

Morgantown, West Virginia
December 27, 1955

Society of American Foresters
Washington, D. C.

Dear Sirs:

Enclosed please find a Money Order for three dollars to cover my Student Membership for the forthcoming year.

To date I have received three copies of the JOURNAL and enjoy each one very much. I don't know how long you have made students eligible for membership in the Society but I think it is a wonderful idea. As for myself, becoming a Student member in such a great organization has made me feel quite proud. It gives me, a "humble student," a feeling of some importance and a realization that in the near future I will belong to a proud profession, and one which is fast becoming recognized throughout the nation and the world. I want to thank you for the privilege of being a member in your society.

Sincerely yours,
/s/ EDRED L. WEBB

Allegheny Section Holds Winter Meeting

The annual winter meeting of the Allegheny Section was held February 10 and 11 in Philadelphia at the Bellevue-Stratford Hotel. More than 200 members and guests were in attendance. Arthur L. Bennett, Section chairman, presided.

The theme of the technical sessions was "Maintaining Pine or Converting Hardwoods to Pine." Among the speakers were R. W. Marquis of the Northeastern Forest Experiment Station; C. H. Stoltenberg of Duke University School of Forestry; A. R. Bond, Maryland Department of Forests and Parks; Silas Little of the Northeastern Forest Experiment Station; and Grant Powell of E. S. Adkins & Company.

On the second technical session the speakers were C. H. Foster of the C. L. Pack Demonstration Forest in New

TABLE 1.—EMPLOYMENT OF PROFESSIONAL FORESTERS IN THE ALLEGHENY SECTION, FEBRUARY 1, 1956

Types of employment	Delaware	Maryland	New Jersey	Pennsylvania	West Virginia	Total
Federal	1	5	6	71	22	105
State	7	27	40	94	33	201
Municipal	1	3	2	5		11
Education		2	3	26	13	44
Pulp industry		7		19	1	27
Lumber, veneer		11	1	24	19	55
Wood finishing, furniture, toys, etc.		1	1	9		11
Railroads, treating, mining, other		2	1	14	15	32
Line clearance, tree surgery, nursery		4		23	2	29
Consultants		10	1	29	2	42
Total	9	72	54	308	107	557

NEW Southworth Brush Cutter

The Southworth Machine Co. has chosen Forestry Suppliers, Inc. to distribute their original and entirely different Brush Saw.

NOW—with SOUTHWORTH BRUSH CUTTER, brush cutting is no longer a problem. It will cut everything from fine weeds up to 12" trees. It will do more work than six men using bush hooks or axes. Because of this, you are guaranteed a quick return on your investment.

This machine is new in design and the ease of operation truly makes it an important tool for forestry. The saw arm elbow and knee joints permit saw to swing or tilt up and down in any direction.

Powered by a rugged 2.8 H.P. West Bend Motor, the SOUTHWORTH BRUSH CUTTER is built to stand the test. Already operated by numerous utilities, highway commissions, Federal and State Parks and others, this machine has proven that it is a cost saver. With the new minimum wage in effect it is more important that we as operating foresters look to fast, economical means of accomplishing the work we have to do.

A "V" belt drive reduces maintenance to a minimum, eliminates costly repairs, gear stripping and makes field repairs easy. Cutter can be disassembled in less than a minute for compact transportation. Three cutters can be carried in the trunk of a car.

The Cutter has rugged, light construction, automatic clutch, finger tip throttle control and large gas capacity. Operates as pruner as well as a brush saw. Saw position changes can be accomplished by merely twisting the wrist.

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York; C. D. Whitesell of the Maryland Department of Research and Education; and W. C. Bramble and W. R. Harms of the Pennsylvania State University School of Forestry.

At the business session certain amendments to the Section bylaws were approved, notably a provision that officers of the Section will take office effective January 1. A committee report, representing a survey of the employment of foresters in the Section, was presented by Edward P. Farrand, and is summarized in Table 1. Henry Clepper discussed national Society affairs.

At the Section dinner on Friday evening, February 10, D. E. Hess served as toastmaster. The speaker of the evening was Dr. Ernst J. Schreiner of the Northeastern Forest Experiment Station, who gave a report on a forestry tour of western Europe illustrated with 3-D color slides.

New officers were installed as follows:

Chairman, William C. Bramble, School of Forestry, Pennsylvania State University, University Park, Pa.

Vice chairman, Ralph C. Wible, Pennsylvania Department of Forests and Waters, Harrisburg, Pa.

Secretary-treasurer, William A. Parr, Maryland Department of Forests and Parks, Bel Air, Md.

Appalachian Section Opposes Minimum Cutting Diameter Recommendation for Virginia

A commission created by the General Assembly of Virginia in 1954 to study the state's forestry situation has submitted a series of recommendations which include legislative action to establish a minimum diameter cutting limit of 8 inches (at 8 inches above the ground) for certain preferred species. (Loblolly, shortleaf, pond and white pine, tulip-poplar, red and white oak.) "Provided, the diameter limits do not apply on areas managed in accordance with forestry practices approved by the State Forester or cleared for agricultural needs."

The Appalachian Section, S.A.F., in meeting January 28, 1956, passed a resolution opposing this recommendation on the basis that it would be poor forestry. The resolution stated in part: "We believe that the essence of a practical forest policy for Virginia is to get more trees in the ground and to increase growing stock and rate of growth. This is best accomplished by such measures as planting, tree farming, forest protection and education. It cannot be done by restrictive cutting practices. Restrictions are preservation measures, and do not increase the number of trees or encourage growth."

Other commission recommendations include increased fire control, expansion of advisory services to landowners, extension of the state seed tree law to make it statewide, increased nursery production and planting, licensing of timber operators and better enforcement of the forest products tax law, expansion of the State Board of Conservation and Development to include five persons familiar with forestry, forestry training for county agents and agricultural students, increased research, and a fifty percent increase in the forest products tax to finance more aids to landowners.

Norman L. Munster (1902—1956)

Norman L. Munster, 54, died in Washington, D. C., February 20, of a heart attack. A native of Wisconsin, born at New Holstein on Feb. 9, 1902, Mr. Munster received his B.S. in forestry from the University of Michigan in 1926 and his M.F. from the same institution in 1930. He was forest manager, in charge of school forests, for the School of Forestry and Conservation, University of Michigan, from 1933 to 1935, joining the Soil Conservation Service, U. S. Department of Agriculture in the latter year in their Washington, D. C. office. In 1937 he was granted leave of absence to attend the Littauer School of Public Administration at Harvard University on a Pack Fellowship, and returned to Washington in 1939 as assistant to the Agriculture Department finance director. In 1943 he joined the Budget Bureau as an agricultural and finance expert in which capacity he was serving at the time of his death.

New York Section Holds Winter Meeting

The New York Section, Society of American Foresters, met in Albany at the N.Y.S. College for Teachers' Brubacher Hall on January 19-20, 1956, for their annual winter meeting. The theme "Forest Plantations—the Course Ahead" apparently was a stellar attraction resulting in a record registration of 157. Under the able chairmanship of William A. Duerr, a group of well qualified speakers presented papers on subjects with which they were closely connected.

Thursday, January 19, in the absence of Chairman A. W. Bratton, Vice Chairman G. A. Pesez called the meeting to order; and following an introduction of Evan R. Collins, president of State College for Teachers, turned the Chair over to Paul Lemon, who presided during the first session of the meeting. Three papers were presented during this session: "The History of

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Motorola "*Big Voice*" coordinates 3-man teams

Louisiana's timberland received another measure of protection recently, with the addition of Motorola 2-way radio to 27 of the Forestry Commission's fire fighting tractors. This boosts the number of radio equipped vehicles in the giant network to 325.

Some 18 major wood growing and using companies cooperate with the state agency in fire fighting by equipping company vehicles with Motorola radios on the state's 3 channels.

The work of the 3-man tractor teams in furrowing, back-firing, and extinguishing unwanted blazes is coordinated perfectly by radio. The drivers receive on-the-spot instructions, communicate between themselves, and report new developments or call for help right from the scene—in seconds, with radio. The Motorola **"Big Voice"** radio, with 10 times normal volume, was picked for this application. Tractor noises can't drown out a **"Big Voice"** message.

Through a unique arrangement, when the tractor is being hauled, its radio unit can be used for radio communications from the cab of the hauling truck. Mr. Vendt says, "On the basis of performance of our 27 units, we are equipping 20 more tractors with Motorola radio. Motorola is accepted as the standard throughout the state."

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Reforestation in New York State" by Charles F. Baar; "The Objectives of Plantation Owners" by Wallace W. Christensen; and "The Status of Forest Planting in New York State" by Miles J. Ferree.

The second session dealing with the potentialities of New York plantations was presided over by L. S. Hamilton.

The opening paper entitled "Wildlife Potentialities of Forest Plantations in New York State" was given by Gustav A. Swanson. Following this a roast beef dinner was served in the cafeteria of Brubacher Hall. At 1:30 Hamilton reconvened the meeting and resumed with the presentation of papers. Robert A. Reed spoke on "Watershed Plantations"; Leroy G. Irving on "Aesthetic and Recreational Potentialities of New York Plantations"; David B. Cook on "Utilization of Plantation Thinnings"; Henry I. Baldwin on "Problems in Thinning Plantations"; and John Fedkiw on "Plantations as an Investment."

The business meeting was called to order at about 4:30 p.m. and reports of standing committees given. As a result of the election of officers—Ralph Unger, College of Forestry, State University of New York, Syracuse 10, N. Y., was elected chairman, and E. J. Eliason to the Executive Committee.

The customary banquet was held at the Aurania Club featuring a tasty meal of roast turkey. John Stock ably acting as toastmaster, introduced several guests from Canada and the Philippines. A most interesting illustrated talk was given by Victor H. Cahalane, assistant director of the New York State Museum.

The Friday morning session opened with a resumption of the business meeting, at which additional committee reports, resolutions, and a short description of the Tree Farm program was given.

During the final session of the meeting under the chairmanship of William A. Duerr, three papers were given outlining policy proposals for New York plantations. William M. Foss spoke on "Plantation Policy for Private Lands," Earl Stone on "Planting Policy for Public Lands," and James E. Davis finished the program with a paper entitled "Plantation Policies in Relation to Education and Research."

Everyone felt that the winter meeting was a fine follow-up on the summer meeting, at which plantations were analyzed in which several types of cultural practices had been carried out. The papers given at the winter meeting outlined the course ahead and have adequately covered the plantation phase—at least for the time being.

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New York Section Society of American Foresters

Resolution

During the past two years, Miss Elaine Drooze, Woman's Program Director of Radio Station WPTR Albany, has been broadcasting interviews with a number of foresters on the various aspects of their work.

The New York Section of the Society of American Foresters assembled in Albany at its annual winter meeting, herewith records its appreciation of this unusual public service to the profession of forestry.

Copies of this resolution, with appropriate comments, will be sent by the Secretary to both Miss Drooze and to the Editor of the JOURNAL OF FORESTRY.

FORESTERS WANTED!

Inspecting a standing utility pole prior to treatment.

Applications are now being accepted for permanent Foreman positions outlined as follows:

- **NATURE OF WORK** — From April through November most Foremen are occupied with the groundline inspection and preservative treatment of standing telephone and power poles. The Working Foreman is in charge of crews averaging 3-5 men.

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- **LOCATION** — Foremen may be assigned anywhere in the northern section of the Middle West and East.

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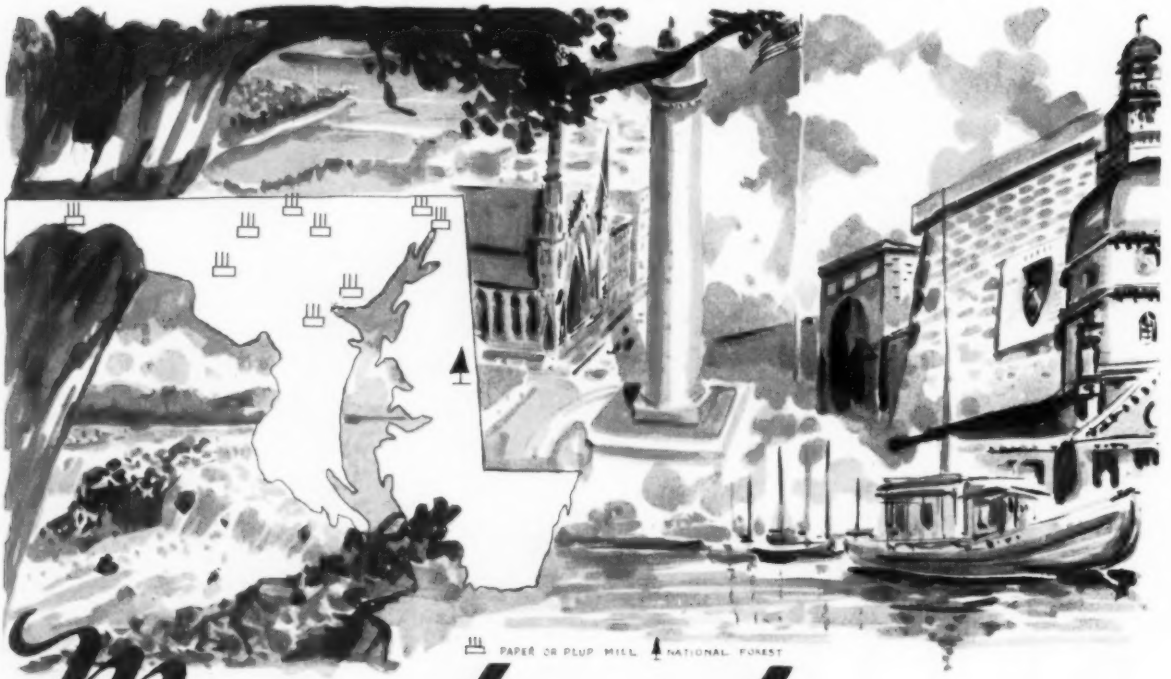

Maryland

—celebrating 50 years of forestry progress

In 1956, Maryland celebrates 50 years of forestry progress, achieved under the state's Forest Fire Control and Woodland Management program.

With 93% of its forests in private ownership, Maryland was one of the first states to recognize the importance of the small woodland owner, and their foresters have a long record of assistance to these individuals in their management problems.

This record is climaxed by a unique Forest Improvement program now sponsored by the state and paid for by the landowners.

Although comparatively small in area, Maryland was fifth in the nation last year in terms of the number of owners serviced under the Cooperative Forest Management program.

Of forestlands not privately owned, most are in state forests and parks and in water company holdings. More recently, industrial or consulting foresters have begun work on company lands where good forestry is practiced.

Because of the extremes in topography, — ranging from the Atlantic Ocean on the east to the Appalachian Plateau of the west, Maryland is sometimes called "America in Miniature." Forests, composed of a variety of Southern and Northern trees, support lumber, millwork, furniture and paper industries with an annual wholesale production valued at about $60,000,000.

—MARYLAND DEPARTMENT OF FORESTS AND PARKS—*contribution to this series does not necessarily constitute endorsement of Southern Glo products.*

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Earle Eaton Shaw (1893—1956)

Earle Eaton Shaw died on February 24, following a stroke several days earlier. He was born Sept. 26, 1893, at Orono, Me. He had been associated with the Canadian International Paper Company since 1928, serving as division manager, Woods Operations, and division manager, Department of Woodlands. Prior employment included divisional forester with the International Paper Company, and forester with Vitale and Rothery, New York, and Eastern Manufacturing Company, Bangor, Maine. He graduated from the University of Maine in 1916 with the B.S. degree in forestry.

Francis Kiefer (1887—1956)

Francis Kiefer, 68, of Marysville, Mich., died suddenly on February 3.

Born in Michigan March 15, 1887, Mr. Kiefer was graduated in 1908 with the bachelor of science degree in forestry from Michigan Agricultural College, now Michigan State University.

He entered the U. S. Forest Service, rising rapidly to the position of supervisor of the Ozark National Forest in Arkansas.

Subsequently, he was employed in Washington, D. C. and in the pulp and paper industry in Ontario. For a number of years he had been with the Port Huron Sulphite & Paper Company, Port Huron, Mich. He had been a member of the Society of American Foresters for 45 years, having joined in 1911.

Government of India
Ministry of Food and Agriculture

New Delhi,
February 6, 1956

Mr. Henry Clepper
Executive Secretary
Society of American Foresters

Dear Mr. Clepper,

In acknowledging your letter of 5th January, 1956, may I say how grateful I am to the Society of American Foresters for electing me an honorary member of the Society.

I regard this as an honour done to the Indian Forest Service, and as such it will be greatly valued by all foresters in India.

With renewed thanks,

Yours sincerely,
/s/ C. R. Ranganathan

Membership Applications and Advancements

Proposals for admission, advancement, and reinstatements received in the Society office during the month of February are listed below.

Action on the eligibility of those proposed for membership as listed below will be taken by the Council as of May 1, 1956. Communications from voting members regarding the membership eligibility of these persons should be received in the Society office prior to that date.

Allegheny Section

Student Grade

Pennsylvania State University

Cromley, D. L. — Lantz, P. M.
Ifft, J. A. — Steward, D. L.
Krivak, J. M.

Junior Grade

Buckley, J. C., Forester, Dept. of Forests & Waters, Huntingdon, Pa.; Pa. State, B.S.F., 1953.

Mires, R. B., Forester, Jersey Package Co., Bridgeton, N. J.; Pa. State, B.S.F., 1950.

Affiliate Grade

Lesher, J. D., Forest Ranger, Cook Forest State Park, Cooksburg, Pa.; Univ. of N. H., B.S., (Forestry), 1953.

Lesher, R. H., Forest Ranger, Black Moshannon State Park, Philipsburg, Pa.; Univ. of N. H., B.S., (Forestry), 1953.

Appalachian Section

Student Grade

North Carolina State College

Duckworth, C. A.

Junior Grade

Hicks, J. R., Forester, U.S.F.S., Hot Springs, Va. Reinstatement.

Morris, C. L., Chief, Div. of Insect & Disease Investigation, U.S.F.S., Charlottesville, Va.; Pa. State, B.S.F., 1949.; Yale, M.F., 1950.

Whitfield, A. L., Field Asst., International Paper Co., Camden, S. C.; Univ. of Ga., B.S.F., 1949.

Member Grade

Thompson, L. N., 2003 Canary Lane, North Augusta, S. C. (Junior, 1948).

Central Rocky Mountain Section

Student Grade

Colorado A & M College

Carter, M. F. — Thompson, J. R.
Tice, R. W.

Member Grade

Collins, P. E., Teacher, Dept. of Horticulture & Forestry, South Dakota State College, College Station, S. Dak. (Junior, 1949).

Crupper, G., 952 Pontiac, Denver, Colo. (Junior, 1949).

Fasergren, F. C., Mess Verde Natl. Park, Mancos, Colo. (Junior, 1947).

Fischer, R. F., Asst. Ranger, U.S.F.S., Winter Park, Colo. (Junior, 1949).

Ford, R. E., Colo. A & M, Fort Collins, Co'o. (Junior, 28R35R46R55).

Griffith, M. J., Dist. Ranger, Burns, Ore. (Junior, 1949).

Knight, F. B., Entomologist, Forest Insect Lab., Fort Collins, Colo. (Junior, 1949).

Malencik, W. J., Dist. Range Mgr., Bur. of Land Mgmt., Durango, Colo. (Junior, 1949).

McKown, F. P., City Forester, Colorado Springs, Colo. (Junior, 1924).

Meierstein, G. W., Plant Ecologist, Corps of Engineers, Sioux Falls, S. Dak. (Junior, 1949).

Murdoch, B. A., Forest Ranger, U.S.F.S., Saguache, Colo. (Junior, 1948).

Columbia River Section

Student Grade

Oregon State College

Collins, J. G. — Pitts, D. W.
Cook, G. J. — St. Clair, F. W.
Evans, K. L. — Thompson, A. G.

Junior Grade

Feasey, E. C., Compassman, Columbia Tree Farm, Vernonia, Ore.; State Univ. of N. Y., B.S.F., 1952.

Gruba, A. G., Forester, Bur. of Land Mgmt., Salem, Ore.; Univ. of Minn., B.S.F., 1950.

Maloney, E. W., Forester, Modoc Lbr. Co., Klamath Falls, Ore.; Utah State, B.S.F., 1947.

IMPORTANT ANNOUNCEMENT

Effective March 1st, on merchandise that we can ship by parcel post, we will pay all postage and insurance ON ORDERS TOTALING $5.00 OR MORE. This does not include any order that must, of necessity be shipped by freight, nor does this include, tree marking or boundary marking paint, weed, brush and tree chemicals.

In making this offer we must conform with postal regulations as to weight, size and product. On shipments that can be made by parcel post but more economically by freight, we reserve the right to ship by freight prepaid, excepting the above mentioned items.

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Russell, H. J., Forester, Hunter & Best Sawmill Inc., Medford, Ore.; Univ. of Minn., B.S.F., 1950.
Wynn, C. W., Forester, J. H. Baxter & Co., Grants Pass, Ore.; Ore. State, B.S.F., 1940.

Member Grade

Bradley, R. L., Staff Forester, Bur. of Land Mgmt., Roseburg, Ore. (Junior, 41R55).
Cronemiller, L. F., Asst. State Forester, Salem, Ore. Reinstatement.
Taylor, V. E., Dist. Ranger, U.S.F.S., Jacksonville, Ore. (Junior, 36R54).

Gulf States Section

Junior Grade

Hatchell, G. E., Rt. No. 1, Denham Springs, La. Reinstatement.
Steven, J. N., Dist. Forester, La. Forestry Comm., Winnsboro, La.; La. State, B.S.F., 1940.

Affiliate Grade

Branch, H. G., Forest Tech., International Paper Co., Colfax, La.; Stephen F. Austin State College, B.S., (Forest Mgmt.), 1952.
Valentine, G. W., Dist. Forester, Southland Paper Mills, Inc., Trinity, Texas; Stephen F. Austin State College,, B.S., (Forestry), 1949.

Inland Empire Section

Student Grade

UNIVERSITY OF IDAHO

Cole, G. F. Hoots, T. A.
Gregg, J. B. Newman, R. J.

Intermountain Section

Student Grade

UTAH STATE AGRICULTURAL COLLEGE

Harvey, E. A.

Junior Grade

Marsolek, D. F., Forester, U.S.F.S., Salmon, Idaho; Univ. of Minn., B.S.F., 1950.

Member Grade

Anderson, R. B., Forester, U.S.F.S., Pinedale, Wyo. (Junior, 1949).
Henthorne, R. W., Dist. Ranger, U.S.F.S., Wellington, Nev. (Junior, 1949).
Koskella, T. W., Dist. Ranger, U.S.F.S., Pinedale, Wyo. (Junior, 1949).
Safran, R. L., Dist. Ranger, U.S.F.S., Jackson, Wyo. (Junior, 1949).

Kentucky-Tennessee Section

Member Grade

Martz, T. B., Industrial Forester, Clinchfield Railroad Co., Erwin, Tenn.; Univ. of Fla., 1949. (Junior, 1951).

New England Section

Student Grade

UNIVERSITY OF MAINE

Jackson, W. L. Standerwick, J. T.
Seaward, C. A.

YALE UNIVERSITY

Hogan, R. H.

Junior Grade

Coulombe, A. G., Forester, Eastern Corp., S. Brewer, Maine; Univ. of Maine, B.S.F., 1955.
Perkins, P. C., Forester, Eastern Corp., Brewer, Maine; Univ. of Maine, B.S.F., 1950.

Affiliate Grade

Dearborn, R. A., Asst. Forester, Draper Corp., Beebe River, N. H.
LaBree, C. E., Asst. County Forester, Ext. Service, Univ. of N. H., Hillsboro County, N. H.; Univ. of N. H., B.S., (Forestry), 1955.

New York Section

Junior Grade

Castagnozzi, D. M., Instructor, N. Y. State Ranger School, Wanakena, N. Y.; Univ. of Mich., B.S.F., 1952.

Northern California Section

Member Grade

Berry, J. S., Owner, Jack S. Berry Lbr. Wholesale, Sacramento, Calif. Reinstatement.
Burns, D. E., Lumber Broker, Redding, Calif. (Junior, 46R51).
Pedlar, J. E., 1057 41st Street, Sacramento, Calif. (Junior, 1949).
Shellstrom, W. N., West Point, Calif. (Junior, 1949).

Northern Rocky Mountain Section

Student Grade

MONTANA STATE UNIVERSITY

Thayer, A. J.

Junior Grade

Arnold, R. W., Asst. Chief Tbr. Mgmt., State of Mont., Kalispell, Mont.; Mont. State, B.S.F., 1947.

Ozark Section

Student Grade

UNIVERSITY OF MISSOURI

French, H. S.

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Campling, C. W., Asst. Dist. Forester, Dierks Forests Inc., Onyx, Ark.; L.P.I., B.S.F., 1952.

Affiliate Grade

Cooper, G. M., Forester, M. L. Sigman, Monticello, Ark.; Univ. of the South, B.S., (Forestry), 1955.

Smart, D. G., Farm Forester, Mo. Cons. Comm., California, Mo.; Mich. College of Mining & Tech., B.S., (Forestry), 1953.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Ahearn, A. D. Olson, H. J.

Junior Grade

Clark, B. O., Forester, U.S.F.S., Ketchikan, Alaska; Univ. of Idaho, B.S.F., 1946.

Gregory, R. A., Forester, Alaska Forest Research Center, Juneau, Alaska; Yale, M.F., 1954.

Schmidt, F. D., Owner, Schmidt Mill Co., Maple Falls, Wash. Reinstatement.

Southeastern Section

Student Grade

UNIVERSITY OF GEORGIA

Berry, W. M. Forsyth, R. H.

Junior Grade

Burke, L. F., Forester, Union Bag & Paper Corp., Helena, Ga.; Univ. of Ga., B.S.F., 1949.

Lane, W. F., Forester, U.S.F.S., Talladega, Ala.; A.P.I., B.S.F., 1949.

Mullins, W. H., Vice President, Southern Timber Mgmt. Service, Inc., Birmingham, Ala. Reinstatement.

Southern California Section

Associate Grade

Klinger, K. E., County Forester & Fire Warden, Los Angeles, Calif.

Upper-Mississippi Valley Section

Student Grade

IOWA STATE COLLEGE

Omundson, F. L. Svensen, W. T.

UNIVERSITY OF MINNESOTA

Chase, R. C. Mellon, D. J.
Churchill, K. T. Roles, J. P.
Kuyava, J. G.

Member Grade

LeMay, P. V., Marathon Corp. of Canada, Ltd., Port Arthur, Ont., Canada. (Junior, 1949).

Sonley, G. R., 40 Peter Street, Port Arthur, Ont., Canada. (Junior, 1949).

Underbakke, M. W., Fountain, Minn. (Junior, 1949).

Welliver, J., 117 8th St. E., Grand Rapids, Minn. (Junior, 1949).

Wisconsin-Michigan Section

Student Grade

MICHIGAN STATE UNIVERSITY

Clark, T. R. Morehouse, P. H.
Dearsley, R. G. Orvis, C. H.
Harrington, D. C. Peer, W. C.
Kovalic, P. P. Rathbun, D. D.
Kulow, D. L. Tobolski, J. J.
Luebs, D. F. Warth, H. O.
Maynard, A. L.

Junior Grade

Auden, A. J., Woods Mgr., Abitibi Corp., Alpena, Mich. Reinstatement.

Kent, L. P., Box 350, E. Lansing, Mich.; Mich. State, B.S.F., 1955. (Student, 1951).

Member Grade

Ashley, R. H., Land Appraiser, Dept. of Cons., Williamston, Mich. (Junior, 1949).

Fields, J. N., 3502 Manitou Blvd., Muskegon, Mich. (Junior, 46R52).

Flink, P. R., Forest Ento., Dept. of Cons., Lansing, Mich. (Junior, 1949).

Gysel, L. W., Associate Prof., Mich. State, E. Lansing, Mich. (Junior, 1949).

Hanson, J., 312 John St., Clare, Mich. (Junior, 1949).

Hovde, S. B., Forester, Wisconsin Cons. Comm., Muston, Wis. (Junior, 1949).

Johnson, V. W., Teacher, Mich. College of Mining & Tech., Houghton, Mich. (Junior, 38R52).

Kollmeyer, H. W., State Forest Service, Mich. Dept. of Cons., Lansing, Mich. (Junior, 1949).

Pfeifer, R. E., Farm Forester, Rt. 1, Ann Arbor, Mich. (Junior, 1949).

Richey, A. L., Forester, U.S.F.S., Milwaukee, Wis. Reinstatement.

Schwartz, R. M., Rt. 1. Adell, Wis. (Junior, 1948).

Affiliate Grade

Archer, J. J., Lab. Asst., Dow Chemical Co., Midland, Mich.; Mich. College of Mining & Tech., B.S., (Forestry), 1952.

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Forestry News

GOVERNOR Theodore R. McKeldin (*R.*) presents a certificate of distinguished service to Dr. Fred W. Besley, first state forester of Maryland, at a dinner honoring him on his 84th birthday at the Southern Hotel in Baltimore on Feb. 16. He headed the forestry department of Maryland for 36 years (1906 to 1942).

Fred W. Besley Honored by Testimonial Dinner

A testimonial dinner in honor of Fred W. Besley on his 84th birthday was held in the Southern Hotel, Baltimore, Md. on February 16.

The first state forester of Maryland, Dr. Besley served in that position from 1906 until his retirement in 1942.

Present, in addition to Dr. Besley's many associates in the state service, were foresters and friends in the legislature, industry, and public agencies. Joseph F. Kaylor, director of the Maryland Department of Forests and Parks was toastmaster.

Among the speakers were Governor Theodore R. McKeldin, R. E. McArdle, chief of the U. S. Forest Service, and John Nelson, former chairman of the board of the Department of Forests and Parks.

Dr. Besley, a Fellow and former member of the Council, is one of the oldest members of the Society of American Foresters.

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Southern Forest Insect Work Conference Organized

The Southern Forest Insect Work Conference was organized in Atlanta, Ga., on Feb., 7. Twenty-two entomologists and foresters attended the meeting. The following officers were elected: R. J. Kowal, chairman, R. E. Lee, secretary-treasurer; and L. W. Orr, L. O. Warren, and R. E. Heinz, counselors, for a period of 1, 2, and 3 years, respectively.

The Conference, patterned after organizations which have operated effectively in the Northwest-Northeast for a number of years, was formed in response to numerous requests from men in the profession. It is intended to advance the science and practice of forest entomology, to provide a medium of exchange of professional thought, and to serve as a clearing house for technical information on forest insect problems of the southern United States. It will encourage the participation of forest entomologists, and entomologists and foresters closely allied to the field of forest entomology. There will be no formal paper reading sessions or similar activity; rather the program will consist of informal discussion of research and research methods, plans, ideas, and acomplishments. Practical problems in forest insect detection, survey, and control will also be included.

The officers come from different segments of the forestry profession. R. J. Kowal is chief of the Division of Forest Insect Research at the Southeastern Forest Experiment Station, U.S. Forest Service. R. E. Lee is entomologist for the Union Bag and Paper Corp. R. E. Heinz is forester for Gaylord Container Corp., L. O. Warren is entomologist at the University of Arkansas, and L. W. Orr is chief of the Division of Forest Insect Research at the Southern Forest Experiment Station.

The first program meeting of the Forest Insect Work Conference will be held during the week of September 9, probably at the Forestry School at the University of Georgia, Athens.

• • •

The U. S. Navy had 50,000 wooden craft in its two-ocean fleet of World War II and it's been adding new wood vessels constantly since the war's end. As a matter of fact, sea-going ships have been built of wood for 4,000 years. A 3,800-year-old, 32-foot boat of heavy cedar planks is one of the top attractions at the Chicago Museum of Natural History.

"Mission 66" Program Presented by Park Service

The National Park Service of the Department of the Interior has developed and submitted to Congress a program, known as "Mission 66," designed to provide more adequate park and recreation facilities in the U. S. Geared to a 10-year program that aims at completion in 1966, half-century anniversary of the Service, the program presents a schedule of money requirements covering each fiscal year from 1957 through 1966 together with plans for balanced, integrated development of park facilities during that period.

The following eight objectives are presented as comprising the basic elements of the "Mission 66" program, "to be accomplished within the limitations of the principle that preservation of park resources is an absolute requirement."

1. Expanded facilities and services in the parks to provide overnight accommodations for approximately 54,000 visitors. Present capacity is less than 26,000. Existing facilities of all kinds—both government and concession—which intrude in unique park features will be relocated in more suitable locations as rapidly as is economically feasible.

2. Provide additional campsites, parking and picnic areas, improved roads and trails and adequate water, power, sewerage and communication systems.

3. Provide the equipment and services which will make the parks and historic areas more meaningful and enjoyable to the public, through an enlarged and more effective interpretive program.

4. Provide adequate operation funds and field staff to manage the areas, protect the resources and provide a high standard of maintenance for all developments.

5. Provide adequate living quarters for field employees who are required to live in the parks.

6. Acquire ownership of all lands within the parks and such other lands as

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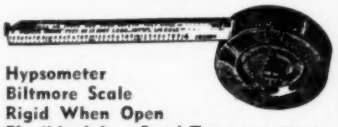

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are necessary for protection or use; acquire water rights needed to insure adequate water supplies, and extinguish grazing rights and other competing uses.

7. Institute a coordinated nationwide recreation plan to produce a system of recreational development by each level of government, federal, state and local, each bearing its proper share of the expanding recreational load.

8. Provide for the continued preservation of large wilderness areas, unaltered and unimpaired, with only the simple facilities required for access, back-country use and protection.

A.F.A. Announces Reorganization; Besley to New Canadian Post

Fred E. Hornaday, secretary of The American Forestry Association for 25 years, has been named executive vice president in a reorganization move by the board of directors to further strengthen and define administrative and professional functions. A new post of chief forester will be created in a department that will devote its full time to the activation of A.F.A.'s Program for American Forestry.

The reorganization followed announcement by Executive Director Lowell Besley that he will pioneer in the establishment of a new forest research program for Canada under the auspices of the Pulp and Paper Research Institute upon the conclusion of the Southern Forest Fire Prevention Conference in New Orleans, Louisiana, April 13-14, of which he is general chairman. A.F.A. is co-sponsoring this project in cooperation with the Louisiana Forestry Association and nine other southern organizations. Mr. Besley will terminate his connection with A.F.A. as of June 1.

Mr. Hornaday, a former field secretary for the Chamber of Commerce of the United States, brings a business background to the new post of executive vice president. When he joined the staff of A.F.A., under the direction of Ovid Butler, he inaugurated many promotional and advertising programs and steadily built up the advertising program of *American Forests* magazine, culminating with its biggest advertising year in history in 1955.

Mr. Besley joined the association's staff three years ago after serving as dean of the Department of Forestry at the University of British Columbia. Participation in A.F.A.'s Higgins Lake Conference marked his first official action as A.F.A. director-forester and he played a prominent role in the Fourth American Forest Congress that followed it. Since that time, he has devoted his full efforts to activatng the Program for American Forestry that grew out of the Congress. He spearheaded the successful effort to amend mining laws that were creating serious abuses on public lands, worked hard in giving newly-appointed Forest Service Chief Richard E. McArdle every support in improving national forests management programs, pushed for forest insurance programs, and this year took direct aim at the problem of wildfires in the South in helping to organize the Southern Forest Fire Prevention Conference in an effort to implement the number one protection plank in A.F.A.'s program.

A.F.A. President Don Johnston states that the appointment of a new chief forester will be announced at an early date.

Death of Mrs. C. H. Shinn

Mrs. Charles Howard Shinn, widow of the pioneer supervisor of the Sierra National Forest in California, died January 26 at Piedmont, Calif.

Like her husband, Mrs. Shinn was identified with early Forest Service progress in California and was a writer of note.

Industrial & Private

Russell Stadelman Named "Man of the Year"

The Memphis Agricultural Club has named Russell Stadelman, chief forester for Nickey Brothers, Inc., Memphis, as Man of the Year in Agriculture in Tennessee. He is the first professional forester to be so honored.

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products mills," the club declared.

"Certainly the forest industry of the Mid-South, which is a major segment of the Mid-South agriculture, owes much to Russell Stadelman who has many times gone the second mile in service to his fellow men," the citation read.

Mr. Stadelman is an active official of the Keep Tennessee Green Assoc., a member of the Tennessee Conservation Commission, member of the Tennessee Tree Farm Committee and one of the prime movers in establishment of the Nickey Tree Farm Family.

Industrial Forestry Association Becomes Nonprofit Corporation

The Industrial Forestry Association will soon become a nonprofit corporation, according to Articles of Incorporation filed in Salem, Ore. This is a change from the original status of voluntary association.

Officers named for the corporation by subscribers at a meeting held in Portland on February 10 are: R. F. Morse, president, and A. H. Brandis, vice president, both of Longview, Wash., R. P. Conklin, treasurer, and W. D. Hagenstein, secretary, both of Portland, Ore. Hagenstein is also managing director.

The association and its predecessors have been actively encouraging better forestry throughout the Douglas-fir region since 1933. The association founded the nation-wide tree farm program in 1941 and operates the West's largest tree nursery at Nisqually, Wash. Headquarters are maintained at Portland, with offices in Seattle, Wash. and Eugene, Ore. The association's staff includes six professional foresters.

Articles of Incorporation call for I.F.A. to engage in nonprofit activities for the forest industry including tree farms, forest practices, forest policy, forest research, forest education, tree nurseries and seed orchards, and related forest matters affecting the Douglas-fir region of western Oregon and Washington and northern California.

Trees for Tomorrow Adds to Staff

Folke Becker, president, Trees For Tomorrow Inc., has announced the addition of two new staff members to the industry-sponsored organization. They are Robert Engelhard, Milwaukee, and Walker Nicewander, Lafayette, Indiana.

Engelhard, a graduate of Utah State, who has been employed by the U. S. Forest Service in the south for the past 3½ years, will work out of the Merrill, Wisconsin office.

Nicewander, a graduate of Purdue University, will be the forester at the Trees For Tomorrow Camp, Eagle River, Wisconsin. In addition to a master's degree in forestry, he has recently completed a year's course in conservation education at Purdue. Nicewander was formerly empoyed by U. S. Forest Service in mid-west states.

R. F. Smith Becomes Partner in Mason, Bruce & Girard Consulting Firm

Mason, Bruce & Girard, consulting foresters, have recently announced that Richard F. Smith is now a partner in its firm.

Smith has been associated with the firm since 1953. His position was for

Richard F. Smith

the purpose of developing a complete woodland management program practical for absentee owners and small privately owned timber tracts.

Mr. Smith will continue in this field, working with the owners, the mills, and the loggers to insure proper harvesting methods which will do the greatest good for both the timber stand and the owner, and to market the various products with the best economic results possible.

Smith received the B.S. degree in Forest Management from the University of Washington in 1947.

Southern Timber Management Service Incorporated

Effective January 1, 1956, the five-year-old firm of Southern Timber Management Service of Birmingham, Ala., was incorporated.

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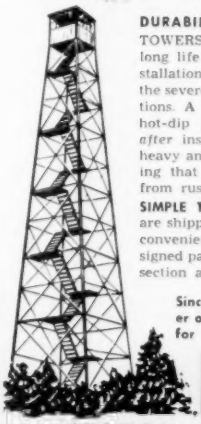

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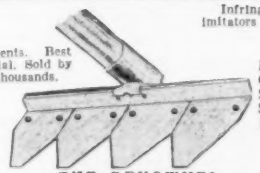

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The addition and expansion of professional services, personnel, and scope of work prompted the act of incorporation. Joining with John M. Bradley, Jr. and Harry E. Murphy, the original partners, were Charles B. Umland and William H. Mullins.

Charles Umland has worked with the T.V.A. for the last 21 years, including responsibility for T.V.A. nursery activities.

William Mullins received his B.S. in forestry from the University of Georgia and his master's from the New York State College of Forestry. He has for the past five years worked in the timberland investment field.

Southern Timber Management Service's Long-term Forest Management Contract, developed jointly with the T.V.A., was given as a primary reason for the firm's incorporation. As a corporation, continuity of organization for the purpose of entering into management contracts will be met.

Education

Midwest Forestry Club Conclave

The Midwest Forestry Club Association will hold its third Annual Conclave May 4, 5, and 6, 1956.

Iowa State College at Ames, Iowa, will be the host for the affair. Other schools attending are: Michigan State University, Purdue University, University of Michigan, University of Minnesota.

The site of the Conclave will be the State 4-H Camp along the Des Moines River, west of Ames. Highlights of the Conclave will consist of orientation of the college campus, a tour through the college-operated television studio, a visit to the Atomic Energy Commission located on the campus, and an afternoon of traditional foresters' contests, climaxed by an evening campfire and speakers.

A unique symbolic traveling trophy will be awarded to the school earning the greatest number of points in the contests.

Why the South Needs No Additional Forestry Schools

The South has seven of the nation's 26 accredited forestry schools. These seven schools are at Alabama Polytechnic Institute, Duke University, Louisiana Polytechnic Institute, Louisiana State University, North Carolina State College, University of Florida, and University of Georgia. These schools have sought to plan their instruction and research so that they complement one another rather than unnecessarily duplicate each other. With the Southern Regional Education Board, they have organized the Regional Committee on Forestry Education and Research to study ways of meeting the South's needs.

The fundamental reason for the present shortage of foresters is that the profession of forestry has not been attracting enough boys into a career in forestry. Too few students means too few foresters. Within existing accredited schools there is sufficient capacity to satisfy the shortage of trained foresters. Each of them can take substantially greater numbers of students, half again as many as they now enroll. Establishing additional schools is not a solution.

On the basis of the above facts, the Regional Committee, which administers the regional forestry program, adopted the following resolution at its meeting on December 11, 1953. It re-affirmed the resolution on November 18, 1955.

WHEREAS, the South now contains six of the twenty-five (now seven of the twenty-six) forestry schools of the country, and

WHEREAS, these schools are capable of substantially increasing their enrollments with their present facilities, and

WHEREAS, these six (now seven) forestry schools have entered into a formal memorandum of agreement with the Southern Regional Education Board to cooperate in providing regional coverage in teaching and research in the specialized fields of forestry, and

WHEREAS, the Society of American Foresters, the Council of Forestry School Executives, and the Commission on Forestry and Related Training of the Southern Regional Education Board have formally stated that the presently accredited forestry schools are capable of adequately supplying the need for trained foresters,

NOW, THEREFORE, be it resolved that additional forestry schools are not needed in the South at this time.

Public

National Park Area Forest Fires Decrease

Fewer forest fires occurred in areas administered by the National Park Service during the 1955 calendar year than in any of the previous 20 years with the exception of 1944 when wartime travel was restricted, National Park Service Director Conrad L. Wirth reports.

The total of 288 fires showed a 27 percent decrease from the 20-year average, Wirth said, even though highly hazardous conditions prevailed in various parts of the country where park areas are located and park travel reached its highest point in history.

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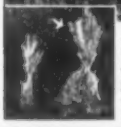

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area, totalling 5,025 acres, was also comparatively better. The number of acres burned amounted to only about half of the 20-year average. The forest area burned over was 4,773 acres less than in 1954 when 9,800 acres were burned. Of the 5,025-acre total, 3,118 acres were forest land; 1,867 acres grass land; and 42 acres brush land.

Particularly encouraging was the marked reduction in the number of man-caused fires, according to the Park Service director. He said that, despite the record 50-million visitors to the national parks, monuments, and other areas in the National Park system during the year, only 173 man-caused fires occurred—the smallest number since 1933, again excepting 1944.

Of the 173, smokers caused 64; campfires 26; incendiarism 20; debris burning 31; and 32 were from miscellaneous man-causes. The remaining 115 of the 288 total were caused by lightning.

Half-Year Receipts from National Forests Total $63 Million

The Federal Treasury received $21 million more from the sale of timber, grazing fees, and special land use permits on national forests during the last six months of 1955 than it did during the same period in 1954, the U. S. Department of Agriculture has announced. If this trend continues, national forest receipts for the year ending June 30, 1956 will hit an all-time high.

Forest Service field offices reported receipts of $63,476,238 from national forest resources between July 1 and December 31, 1955. This compares to $42,404,302 for the last six months of 1954. Most of the increase came from timber sales.

Land utilization projects on submarginal land put under federal administration during the 1930's netted $1,139,999 for the last six months of 1955, as compared to $915,898 for the same period in 1954. Receipts from these lands came from hay, grazing, timber, recreation, mineral leases, and other miscellaneous uses.

Forest Genetics Center Planned for Wisconsin Area

A new forest genetics center is to be established near Rhinelander, Wisconsin, by the Lake States Forest Experiment Station of the U. S. Forest Service.

Land has been cleared and building plans drawn. Construction will begin early this year near the Hugo Sauer Nursery. The initial structure will include a greenhouse, potting and grafting room, laboratory, work shop, cold storage room, pollen extraction chamber, and fireproof storage and office space. Other essential buildings will be constructed as funds become available.

This center has been made possible through an expanding interest in tree improvement work by industry and public and private agencies.

Third Army's Forestry Program

The Third Army's forestry program has netted the government nearly $5 million in the past five years, a Third Army Engineers' report shows.

The harvested timber has been sold for commercial use or used by installations in the seven-state Third Army area at considerable savings. Timber is harvested, however, only to preserve the usefulness of the lands, which are held by the government for one purpose—troop training and the support of Army forces. The merchantable timber is a by-product of this management designed to preserve ground cover and prevent erosion and waste.

Forest products harvested by contract with private mill owners during this period include: 113,678,000 board feet of pine, 12,886,000 board feet of hardwood, 175,120 cords of pine pulpwood, and 614 cords of hardwood pulpwood.

Twelve professional foresters and a crew of 50 men are engaged in the forest management program. It includes fire protection, harvesting, reforestation, and the growing of maximum amounts of natural game food. Forested lands comprise more than 70 percent of Third Army's approximately one million acres in the southeastern states.

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Total cost of the program for the past five years has been $885,757 and fire losses have been held to 3.4 percent of the forested area.

Earle R. Wilcox Changes Position

Earle R. Wilcox, forester for the Klamath Indian reservation, has resigned to accept a position as consulting forester for the three-man committee that is working on the liquidation of the Klamath reservation under the act of Congress passed two years ago.

Wilcox was graduated from the University of Washington with the B.S. degree in forestry.

He has been associated with the U. S. Indian Service since 1946.

D. D. Wooldridge to New Research Position

Increased attention to watershed problems in the central Washington area has led to the establishment of an additional staff position at the Forest Service's Mid-Columbia Research Center in Wenatchee. Creation of the new post was announced by Director R. W. Cowlin of the Pacific Northwest Forest and Range Experiment Station in Portland.

David D. Wooldridge has accepted appointment as project leader in charge of watershed management research. Headquartered at Wenatchee, his work also will be carried on in the Ellensburg and Yakima areas.

Studies to be carried on include investigation of snow melting rates, the effects of timber cutting on snow accumulation, and the impact of both on streamflow.

Following service in World War II, Wooldridge completed requirements for a bachelor's degree in forestry from the University of Washington and later returned for graduate work in forest soils. Prior to his appointment, he was employed by Rayonier Inc. as a research forester.

Allied

F.P.R.S. Holds National Meeting in June

The program of the 10th National Meeting of the 3,000-member Forest Products Research Society to be held June 4-7 in Asheville, N. C., has been announced by Moss B. Christian, national F.P.R.S. president, and E. S. Harrar, general chairman. Christian is director of research, Chicago Mill and Lumber Co., Tallulah, La., and Harrar is professor of wood technology, School of Forestry, Duke University, Durham, N. C.

The Society's president-elect, Ralph H. Bescher, district manager, Wood Preserving Div., Koppers Co., Pittsburgh, Pa., is chairman of the technical program which will be held throughout the week. Committee meetings are under the direction of Vice President Frank H. Kaufert, director, School of Forestry, University of Minnesota, St. Paul.

The technical program will include sessions on Quality Control, Wood Preservation, Veneers and Plywood, Wood Seasoning, Hardboard and Chipcore, Wood Finishing, Containers and Packaging, Glues and Gluing, Marketing of Wood Products, Machining of Chipcore, Chemical Utilization, and Logging and Milling. In addition, field trips to a variety of wood products manufacturing plants in the Asheville area are also planned.

Boy Scouts Seek Forester with Southwestern Experience

The Boy Scouts of America are seeking a forester with suitable Southwestern experience and interests for a position on an extensive property owned by them near Cimarron, New Mexico. Work will include supervision of a large timber sale and will require a knowledge of range manage and wildlife management, as well as ability in planning programs of the national training center located on the ranch during summer months. Position has definite possibilities of permanence. Open immediately; salary based on experience. Inquiries should be directed to Mr. Ted S. Pettit, Director of Conservation, Boy Scouts of America, National Council, New Brunswick, N. J.

Forestry Employment

S.A.F. members are privileged to insert one 60-word advertisement in this column without charge. Forest industries desiring to employ foresters may insert advertisements at the rate of $4 per column inch. Copy must be received by the end of this month for an advertisement to appear in the issue after next.

Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiations.

Positions Wanted

Forester with over 27 years of government service desires position in an administrative capacity, preferably in the East, which individually or collectively requires unusual abilities in watershed management and related recreational resource development activities applicable to large or small reservoir areas; thorough knowledge of timberland management, timber appraisals, sales and contracts; land and map records; and general administrative duties.

Box A, Journal of Forestry, Mills Building, Washington 6, D. C.

This D9 heads a line-up including a D8, D7 and D6 building 18 miles of road for Oliver & Oliver Logging Company in mountainous country near Thompson Falls, Montana. The road will tap at least 50,000,000 bd. ft. of timber on U. S. Forest Service land.

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